discovery of nothing

a new interpretation of reality

by lyle d jacobson

DISCOVERY

OF

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OF REALITY

Lyle D Jacobson

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Introduction

A New Philosophy of Nature

THIS PHILOSOPHY identifies and explains a common foundation of existence used by nature and humans. It will reveal principles that apply to everything in the universe. It will sharpen our view of what is happening around us. By applying this philosophy, we will be able to see the universe as a whole structure instead of merely seeing its separate parts. It will change our interpretation of reality so we can get back to cause and effect and a one-to-one correspondence with nature. The philosophy shows the meaning of "purpose" and that it is the same for all natural phenomena. It can help us come to a better understanding of ourselves by showing us how to identify ourselves with the rest of the world.

As always, there will be controversy over and resistance to anything new that can bring about change. But if we are to survive, change is necessary and progress can occur only when a more useful and better way of solving problems comes along.

This introduction gives the reader a background on how these ideas began and the purpose and direction of this work. Throughout my life, I have been obsessed with the desire to know the *why* of things. This continuing natural curiosity created a paradox, and I suspect the same is true for many people. Why was I such a poor student during my school years which barely culminated in a university degree? Why did I have such curiosity and also such difficulty in our institutions of learning? I think I have arrived at some answers.

My failure to be excited about our "education" system came from lacking a base and foundation from which I could relate one thing with another. Everything seemed so isolated. The so-called "facts" lacked a linking philosophy whereby I could see the wholeness of nature. I was missing how things related to me. Our minds of necessity have made us proprietary in wanting things to relate to ourselves. This is important to our survival. The problem was, I was required to memorize data that I could not associate with. I rebelled at filling my mind with what I could not connect to and make a part of my existence. Although it was not this way with everything, I forced a lot of intellectual garbage into my mind to pass examinations, and it was rapidly removed afterwards. It was always painful and required enormous will power to survive these school years. My mind seemed to function only in an integrative way.

Today, physics is also at an impasse because it has not brought the universe into what has been referred to as an "unbroken wholeness." The present stage of knowledge does not link together physicists' isolated theories. They claim to have made these links partially, but even in these areas, many of their interpretations read like science fiction and have little relationship to logic and cause and effect. Because of this I believe that what you are about to read is the core of a philosophy whose time has come.

I have always been a very slow reader and I finally realized why. Sometimes I would spend hours on one paragraph, rethinking and rereading it over and over again. I attempted to relate my

reading to my life experiences and those of others. This takes time, but this very slowness of acquisition produced greater quality thinking for me. I have used this method to identify a cause-and-effect world for myself. It has brought me into a closer relationship with the natural world around me.

After graduating with a doctorate in dental surgery, I took up the process of understanding natural phenomena for myself. The question for me was, how did I relate to this world of which I had become a part? I had no idea where this would lead me. Fortunately, I found some effective teachers and finally began to gather the tools necessary for the pursuit of knowledge.

I learned where the useful knowledge came from that has given us the resulting leverage to support billions of humans on this planet. It is said that there are more people living on the planet now than have ever existed. It had never occurred to me that so many people's lives are made possible by the discoveries of just a few other people. It was a revelation to learn that a small group of innovators has been responsible for the discoveries that have made our lives possible. Isaac Newton, Louis Pasteur, Michael Faraday and James Clerk Maxwell are a few examples of the giant thinkers belonging in this category.

I learned this in middle age. I was awed and perplexed by the question of why the source of so much human life had never been explained to me. It seemed incredibly wrong that I might have gone through life and never realized the debt all of us owe to so few. For me it really put things in perspective. It gave me direction where to find real heroes. The purpose of heroes is to give us an example and pattern to emulate and follow. It has been an enormously profound and gratifying experience to come to this awareness. For those interested in an introduction to history's scientific heroes, I recommend Isaac Asimov's *Biographical Encyclopedia of Science and Technology*. It presents the lives and achievements of most of our greatest scientists, philosophers and technologists in Asimov's powerful style. In chronological order, he shows the intellectual relations between these fascinating indi-

viduals. It is important for all of us to understand those who are primarily responsible for the advancement of civilization.[1]

How did these people go about creating and giving us such incredible value? They must first have intellectual curiosity: the desire to know. From this I learned a few important mental instruments that innovators use in the search for answers. I learned about the steps of the scientific method, as a guide for recognizing both when you are on the right path or when you are on the wrong path to greater knowledge. Knowing the path *not to take* is a necessary input for finding the path *to take.*

The next powerful tool was a simple statement that to add to our knowledge of natural phenomena, you show how "less" information explains "more." For me this meant that success in my search for answers about the world would come from finding the simplest base and foundation that everything has in common. "Less" to me seemed to require less information to explain more with the goal of reaching a position where the least input defines the principles that govern everything. This is how I interpreted this statement of making *less explain more,* and I have found it to be correct.

With these powerful tools, I began my search for the simplest common denominators I could find from which all natural phenomena would spring. What is there about nature that everything is a part of and is involved with? I have found that finding this common ground that leads to fewer (simpler) principles is not easy to do. Some of our greatest discoveries have become commonplace that it is easy to think that they have always been known. Few gain the insight into the great struggle involved in taking the steps along the path of progress. We take for granted some of the most profound discoveries in the world.

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[1] Asimov, Isaac, 1972. *Biographical Encyclopedia of Science and Technology: The Lives and Achievements of 1195 Great Scientists from Ancient Times to the Present Chronologically Arranged.* New York: Doubleday.

I took up this search for answers about nature for my own enjoyment. My motives did not come from any desire to save humankind. I just wanted to know for myself.

After a few years of taking many wrong paths to understand nature, in 1978, I read a brief paragraph on Eastern philosophy. It described the concept of "nothing" as a very important entity and that physical matter is used to mold and build the nonphysical (nothing). The borders of something provide an identity for nothing and conversely. The void (nothing) is shaped by the physical so we can fill it with other structures. An example is the physical structure of a wooden bowl that shapes and gives form to the *nothing* inside that then can be filled with things. This was an amazing realization to me. Who was the forgotten Asian, thousands of years ago, who made this observation? Whoever he or she was, I offer my gratitude for giving me the key to a meaningful life.

Now I began to relate this entity of *nothing* to all the physical things around me. And I was off and running — although it seemed like a crawl — after taking seventeen years to reach some vital conclusions. It has been an exciting adventure with one discovery following another. What astonished me was the realization that I could only sense a *physical* object because of *nothing* next to it. It is also the physical of an object that gives us the ability to see and define the spatial geometry of nothing. The contrasting opposite nature of physical and nonphysical entities is what gives us our sensory perceptions. It sounds so simple and yet to me it was profound. It appears that our frame of reference for observation and measurement comes from the interdependent physical (something) and nonphysical (nothing).

It seems so obvious — after it has been pointed out — and yet I had to ask, why had I never seen this simple idea written or heard it spoken? Would it not be important to understand that it is these binary opposites — something and nothing — that allow us to define our existence and to frame our ability to know what is going on around us and within us? If we have not consciously noticed these binary relationships, could this be a reason for our

difficulties in interpreting natural phenomena? I attribute the difficulty of noticing this to the fact that the most obvious has somehow become the least obvious. In the following chapters there will be many examples to illustrate this point.

We have a one-way vision of the physical world, and the purpose of this work is to show how the nonphysical is a necessary and indispensable partner of the physical. When we focus on the physical, we fail to perceive that it is the existence of the nonphysical that allows the perception of the physical in the first place. It is also *nothing* that allows *something* to have a path for motion and a place to exist.

In 1983, at age 52, I retired from dentistry to build a sailboat and explore the Caribbean sea. I have always had a fascination for the ocean, and a sailboat seemed an ideal vehicle to that end. Outside of exploration, this would also give me more time to delve into this new binary concept of the physical and the nonphysical.

From this approach I had gained a deeper insight into human action, and then I decided to see if this would also apply to science and physics. To integrate a theory, it is important to make the same predictions in areas that seem totally unrelated to each other and then see if they come true. If the predictions came true for unrelated areas, then this would be a significant corroboration of the new theory. For example, if we can show that human action follows the same rules as the rest of nature, then we have good reason to believe that this new developing idea is correct. Nature should be explained in a way that makes our existence understandable. In other words, since man is a part of nature, then a test for the rightness of our interpretation of nature should be based upon its success in explaining us. This philosophy shows for the first time that the base and common ground for what we do is the same for all of nature.

I first had to gain more knowledge of traditional science and to do this I purchased and studied many books on physics and general science written for educated adults. How did this new idea fit into mainstream science? It eventually became clear to me

that somehow the deep meaning behind the "nonphysical" has been missed. This has placed scientists in the difficult position of trying to interpret nature without this underlying recognition. It has led them to a thought process where cause and effect and a one-to-one correspondence with reality has been lost, or at least is held in question. As we shall see, the basic problem is that our mind seems to associate only with the physical, but we also use the nonphysical to perceive the physical without realizing it.

After some years, it became obvious I was heading in the right direction. The world was finally making sense. A process of integration was taking place whereby I could begin to see the relationship between widely separated entities. For instance, as incredible as it may sound, the attraction between the poles of a magnet is related to the same principle of attraction between a man and a woman. Behind all motion — which includes electrons, gravity, and people — there is the same underlying foundation.

I have approached my work as the detective searching for clues to solve a mystery. Each time I came upon another corroborative answer, this new knowledge gave me momentum to keep going.

These discoveries became an exciting part of my life. But this led to a new problem. How was I to communicate this information to rational human beings? It became clear that I could not do this with casual conversations. So there I was with a new philosophy that I was unable to communicate. I have learned that I do not want to become a complete loner and I do want to receive value from others. This treatise is my effort to explain my thinking so I can gain further knowledge from the discussions and action that may come from it. Of course, these ideas must give value to others in order for me to gain value from them. My efforts here are purely selfish, which means that for me to gain value I must also give value. The word "selfish" does not have to mean a one-way process. To attain real and lasting value for ourselves may only be possible by providing value for others. I will expand on this later.

I will now introduce a Hypothesis (Generalization) and several corollaries that spring from this generalization. The comprehensive meaning behind them will be difficult to grasp now; however, I will acquaint you with them here so you can refer back to them as you read the main text. They are straightforward and uncomplicated. The main difficulty in perceiving their importance is in their newness. To enhance your understanding, you will find it useful to refer to them again and again. I promise you a new approach on how to relate to the world — an approach that for me has rendered the world a more meaningful and beautiful place in which to live.

Hypothesis (Generalization)

The universe is composed of and structured by the interdependent opposites of the physical (1) and the nonphysical (0), where the physical organizes and uses the nonphysical to reach absorption through emission.

This hypothesis provides the foundation for everything in this work. The corollaries follow from and are part of the generalization. The meaning of *absorption* and *emission* will follow.

Corollary #1

Both the physical and the nonphysical are mutually dependent upon each other for defining their existence.

For many it may seem to be counterintuitive for *nothing* to have an *existence*. The extreme opposite nature of the nonphysical nothing to the physical something is precisely what makes *nothing* stand out with such clarity and gives it an identity. It may be easier to think of *nothing* as the existence of nonexistence.

Corollary #2

The physical and nonphysical represent the frame of reference for all observations and measurements.

Corollary #3

The universe is a physical filling (absorption) and emptying (emission) of holes (nonphysical), realized through the development and use of the nonphysical by the physical.

Corollary #4

For a structure to have existence, viability and function it must continue to oscillate between absorption (fill) and emission (empty).

The effective application of corollary #4 will foster the temporal extension of human life.

Corollary #5

The universe is binary (0-and-1).

Corollary #6

The binary nature of the physical and nonphysical produces two forces in nature: the force of attraction (0-to-1 and 1-to-0) and the force of repulsion (0-on-0 and 1-on-1).

Corollary #7

The physical and nonphysical cannot be created or destroyed; their shape and form will change, but the amount of each will always be conserved.

Corollary #7 extends the mass/energy conservation laws of physics by including the nonphysical which is a necessary partner to the physical of mass/energy. With its inclusion we can reach a better understanding of energy and how it relates to mass.

Corollary #8

The foundation and source of all opposites are the physical (1) and nonphysical (0) with the resultant forces of attraction (0-to-1 and 1-to-0) and repulsion (0-on-0 and 1-on-1).

The above corollary means that all the opposites used in our language flow directly from the binary physical and nonphysical relationships. Using this, I will show how some of our most important antonyms can be redefined to give them more meaning and therefore more useful information about human interaction. This will lead us to a better understanding of ourselves.

Corollary #9

Opposites define each other and cannot stand alone; to know one is to know the other.

These corollaries will be referred to frequently with explanations and examples. By associating the concept of *nothing* alongside that of *something,* we can begin to make more sense out of our relationship with nature.

I have confidence in the truth of this concept because of the way it ties together and integrates natural phenomena. It provides for the first time an explanation of how biology relates to the rest of the cosmos. We relate to nature in the same way everything relates to nature. I will show a principle that is fundamental to a unified understanding of the cosmos.

I recognize the primitive nature of the first attempt. There is always a better way. There are no final bests. "Best" is only for the present. With success and time this work will appear archaic. Here is an analogy that I learned from one of my teachers.[2] The Wright Brothers' first airplane was primitive compared to today's

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[2] A favorite analogy of astrophysicist Andrew J. Galambos.

models, but it did fly and there always has to be a beginning for everything. In a similar way, this work will someday look primitive, but I believe this new philosophy does *get off the ground* and that it will someday lead to the equivalent of a computer-designed Boeing 777.

It is important to read this treatise in sequence. I am aware of the difficulty of communicating ideas when they are out of sequence. I also caution the reader not to throw away everything in this text or stop reading because of a perceived failure of some prediction of this philosophy. I will stand by the basic principle as being correct and necessary for our next leap forward in understanding nature. I predict that this basic principle points in the direction that will lead to solving our major problems which are always a result of past solutions. As will be discussed, our problems and solutions must proceed in an ongoing sequence with one following the other if we are to survive. This ensures a developing and dynamic civilization.

It is easy to see that a problem is necessary to get to a solution, but it is not so easy to see that a solution is necessary to get to another problem which then leads to another solution, and so on. This is a built-in oscillation that is the essence behind the evolution of life on this planet. When life forms cannot solve these necessary, continuing and important problems, they "make way" for those that can by becoming extinct. If we are to continue to exist, we must add to our knowledge through new problems (challenges) that spur new solutions. Nature decrees that our continued existence means continued improvement. We are doomed to social retrogression if we try to continue our existence by only using past solutions.

This principle will also show the simple nature of what "better" means. So much for the introduction; let us now proceed to the main part of this treatise.

CHAPTER 1

The Binary Nature of the Universe

My FOCUS will be on emission and absorption and the forces that cause them. I will show that these processes spring from a universe that has a binary foundation involving the physical and nonphysical. This new view is meant to guide us in a new direction for explaining natural phenomena. The principles set forth will first concentrate on how they relate to human action, then we will move on to other systems within the natural world to show that they also operate within the same framework. My goal is to show a common ground that will be predictive for all nature.

There may be greater clarity if we start with ourselves. Our interest in any subject has its roots in how the world relates to us. It is observable that we spend our lives going from one place to another. Our goal is to reach a different location from where we started. Our ability to do this depends on our success with motion. The human body is a tool for motion that we use to start and to reach new locations. Before continuing, it is important to identify the meaning of the term *location*.

We use the physical part of nature to build edifices wherein we can place our own physical structure and other physical objects we have built. Homes, offices, factories, schools, warehouses, restaurants and all kinds of packaging and storage containers are examples of the locations in which we place ourselves and other objects. Why are we attracted toward moving ourselves and other things into these structures? When we occupy such places, what do we occupy?

We commonly think and say that we occupy the physical buildings we have built. When humans lived in caves, we say it was the physical cave they occupied. The physical part of us cannot enter and displace the physical part of other structures. Early in life we learn the pain of too forceful encounters with other physical objects. Our senses allow us to determine and feel the borders of something, but our tangible parts are not allowed to occupy other tangibles. If a physical cannot occupy another physical, what does the solid part of us occupy when these *leaving-and-entering* processes occur? What we actually occupy and displace is the space that is organized and identified by the physical part of these structures. Locations are the organized space we seek to fill through motion.

Natural structures are also involved. When we dive into a lake, we think of ourselves as occupying water, but more precisely our physical body pervades and fills (occupies) the space surrounded by water. In a similar way the building of civilization is an organization of *space* that we are induced (attracted) to fill. The structure of a city represents an array of container technologies. These containers of civilization can be thought of as holes that we both fill and empty. To understand my use of the word "hole" we should go beyond the concept of a "hole in the ground." The common hole in the ground is seen and identified by the walls of the earth. It is important to extend this concept to all structures. Wherever the physical exists, it identifies and describes the nonphysical space next to it. The geometrical borders of the physical gives us the borders and a geometrical shape of the nonphysical. When we build these containers, we shape and mold the space

for the arrival and subsequent departure of ourselves and other objects. The surface of *something* gives meaning and usefulness to the space of *nothing* next to it. A table is built to give us the proper space (hole) above it for the placing (occupation of the hole) of objects upon the table. And the nonphysical gives identification and geometrical shape to the physical. The physical and the nonphysical are each given meaning and identity through each other. (see corollary #2)

This means that our physical bodies also organize space that is both internal and external. Why are we attracted to the physical objects we desire? We want to fill the spaces (the holes) that our physical being has created. We fill and occupy the holes formed by our houses and other structures so we can in turn more efficiently fill our own internal and external spaces. We do this in myriad ways. An important part of all houses is the areas that facilitate the filling of our internal spaces with food. Clothing is an example of an external fill. Libraries and computers are reservoirs (filled containers) of information that can be used for the internal filling of the mind.

We move our bodies for the purpose of having our organized spaces filled with the physical structure of choice. But first we must fill the areas of other structures to come to our own fill. We are both absorbers and provide absorption for other absorbers, because we are both physical and nonphysical. As our physical structure fills the nonphysical component of other structures, we have our nonphysical component filled by the physical part of their structures.

When we move about the world, we fill other structures so that we can be filled. We create an absorbing process for other things so that we can have absorption. To fill and enter is to also be filled and entered. We occupy these containers of civilization so that we can also be occupied. As will be seen, this is the essence of providing value (absorption for something or someone else) in order to receive value (absorption for ourselves).

This means that *attraction* is the physical and nonphysical for each other. The organized nonphysical hole wants to be filled and

the organized physical wants to do the filling. This is accomplished through the motion provided by emission. The success of motion is accomplished through absorption (arrival within the parameters of the hole). Our motion is used for filling our external and internal holes with the physical objects of choice. This is the crux of Corollary #3: *The universe is a physical filling (absorption) and emptying (emission) of holes (nonphysical), realized through the development and use of the nonphysical by the physical.* Our body represents the physical's development and use of the nonphysical. All human action is for the arrival and success of filling our spaces. The other side of this is the necessity of emptying our spaces so we can accommodate another fill.

A seemingly pregnant question may arise, "so what"? How can this view tell us anything significant about the natural world of which we are a part? I propose that understanding the role of the nonphysical is the "missing link" in our approach to reality. The problem has been that our attempt to understand reality has always been directed toward the physical part of nature. It is stated repeatedly in scientific literature that the purpose of science and physics is to have physical theory match physical reality. With this unilateral focus on the physical tangibles of nature, we have missed seeing the complete role of the nonphysical. When we concentrate on the interdependence between the physical and the nonphysical, the image of a world of cause-and-effect having a one-to-one correspondence with reality will begin to emerge.

Now there is a reality crisis in human knowledge which includes a critical area in science and physics. I have promised you a new view of nature that will integrate our thinking with the world around us. The purpose of this work is to bring us to a new dimension in logic and reason and to a new and better approximation of reality.

At the heart of this view of nature is *emission* and *absorption.* The terms emission and absorption refer to physical action. In introducing the scope of the nonphysical, it can be seen that the physical is only able to exist at some place because it has the nonphysical to occupy. These locations (holes) of occupation have

meaning and identity because the physical part of structure determines the geometry, shape and position of these holes. Our house is a hole that we mold and build with the physical walls, roof and all the internal tangibles within. When we are in residence, we are in a state of absorption through the occupation of these specific holes. We can think of ourselves as being absorbed by our residence (container) which is both physical and nonphysical. And we, in turn, use the physical home and the physical objects within to fill (to absorb) our spaces.

When we leave our place (hole) of residence, we use the process of emission which is accomplished by our motion. Motion is the emission stage that allows us to empty this and other organized holes. The absorption stage is the opposite concept — the fill and entering stage — and it is accomplished through the emission stage. We emit the hole of one container to fill another. We reach toward absorption through the motion of emission.

Absorption and emission are a two-stage process. The human goal is to reach the stage of absorption which is accomplished through emission. One cannot occur without the other. To absorb we must also emit, to fill we must also empty. When one hole is occupied another one becomes unoccupied. This means there is a conservation of holes (Corollary #7: *The physical and nonphysical cannot be created or destroyed; their shape and form will change, but the amount of each will always be conserved*). When one hole disappears through absorption (the physical's appearance), another hole appears by emission (the physical's disappearance). A filling of one hole is always accompanied by an emptying of another hole. The importance of this will come later.

Our civilization is a series of holes. We build holes for our departure and holes for our arrival. The pathways and highways we build are holes we use for the conveyance of the physical through motion. It takes motion (emission) to reach holes for absorption. Containers are used for absorption and pathways are used for emission. Parallel to our roads, there are emission pipes (holes) for water drainage and water access, sewage disposal and electrical conduction. These conduits have a physical framework

for the purpose of building and creating an organized identity for the nonphysical. This allows us the medium of nothing (holes) to transport things to us for filling our spaces and to transport things away from us for emptying our spaces. The human body does the same thing. The specialized organs within us contain holes built for filling and emptying the necessary physicals. A city is just an extension of man and his systems. The diverse types of conduits that unify our cities are analogous to the diverse types of conduits that unify our human system.

The human body is a series of complex containers (cells) that use pathways (holes) such as veins, arteries, nerves, small and large intestines, lungs, kidneys and urinary tract, etc., for emission away from (emptying) these cells to prepare for another absorption by filling them again.

The underlying nature between both the human body and the human city is the use of the physical to mold and build holes for emptying (emission) and filling (absorption) the physical. We have external holes such as ears, pupils, mouth, nose, urethra and rectum that facilitate moving things in and out. Our nerve network exists to transmit stimuli to and from the brain. Absorption for the brain leads to emission from the brain to absorption by the cells that control our muscles. Muscles are then used for the emission of the human body. Notice the domino effect here. Absorption leads to another emission and another absorption and so on. It is this internal oscillation of the emptying (emission) and the filling (absorption) that allows us to repeat this process with external objects. The fluctuations of fill and empty extend both inward and outward.

Our human goals are to reach a fill for ourselves. The emptying stage is preparation for the reoccurrence of the fill. We get things out so we can get things in. The hole must reappear before it disappears by filling. The conclusion is that the viability of a structure, human or otherwise, depends upon its capacity to keep oscillating between the fill and the empty. This can also be referred to as an oscillation. An object with an oscillation of one indicates a system designed to be filled and emptied once. Any

disposable such as a paper cup is an example. An object with an oscillation of one thousand indicates a system built to be filled and emptied a thousand times. The more a structure's oscillation between the fill and empty the greater its viability — the longer its life. Corollary #4: *For a structure to have existence, viability and function it must continue to oscillate between absorption (fill) and emission (empty).*

The *fill* can be thought of as an addition process and the empty as a subtraction process. When an object is in a filled condition, it is positive (addition) and when empty it is negative (subtraction). When we are hungry we are in a negative condition of emptiness. This emptiness causes an attraction toward the physical food that will provide the positive condition of the fill. The hungry person moves his empty (hole) system (a negative) toward food (a positive). There is a natural negative and positive attraction. The hungry negative (hole) first moves toward the positive food and then the food moves toward the negative (empty). The negative is the organized hole of nothing and the positive is the organized something designed to fill a particular hole. Does this have any relationship to the positive and negative charges in electromagnetic phenomena? More on this later.

This will be easier to understand using a simple drinking glass as an example. We build a physical drinking glass to form a hole to be filled for the transportation of liquids. To fill a hole in the human structure, we reach for the empty glass because we are attracted to the physical water and we use motion (emission) to gain our fill (absorption). We have transferred absorption of the glass (filled with water) to absorption of the human container. These are negative-to-positive oscillations from one system to another. The driving force for motion is an attraction to fill the empty condition. To reach the fill is to change a negative to a positive. It is important to remember that these two stages occur one after the other and are never simultaneous.

The common use of opposites such as positive and negative, fill and empty, arrival and departure, enter and leave all describe emission and absorption. In each pair, one denotes the beginning

of motion producing the empty and the other denotes the end of motion producing the fill.

Now let us examine this generalization. **ALL OPPOSITES ARE DERIVED FROM THE PHYSICAL AND NONPHYSICAL.** This is a derivative of Corollary #8 and is the foundation from which all opposites spring. The physical and nonphysical are the supreme opposites. It is these opposites that give us the symmetry necessary to better explain how nature functions. The symmetry of natural phenomena is derived from this binary source.

I will now show the dependency of the physical and nonphysical upon each other. This dependency is extendible to all systems because all systems are a composite of the physical and nonphysical (Corollary #1). I will do this by considering the emission and absorption phases perceived by our five senses.

The five senses that include sight, touch, hearing, taste and smell are not possible and *do not exist* without their opposite conditions: no sense of sight, touch, hearing, taste and smell. It is necessary to have the empty nonphysical condition of not sensing in order to have the filling physical condition of sensing. Experiencing the senses is a positive process that must be experienced through the negative process of not sensing. As nothing is necessary to reach awareness of something, so is the nothing of the empty necessary to reach awareness of the fill. And conversely, a fill is necessary to gain awareness of an empty. The ability to sense something is dependent upon the prior recognition of when we cannot or do not sense something.

A profound integrative experience of my life came from the realization that I was able to visualize tangible physical objects only because of the nonphysical space that was next to these objects. The borders of *something* are defined by the borders of nothing next to something. (Corollary #1, *Both the physical and the nonphysical are mutually dependent upon each other for defining their existence.* Corollary #9, *Opposites define each other and cannot stand alone; to know one is to know the other.*) It also works the other way: we can recognize *nothing* because it is defined by the borders of *something*. This was a profound revela-

tion to me. All my life I had been seeing and identifying objects around me, but I had never realized the importance of the NOTHING that surrounds them. I had never seen stated anywhere the importance of understanding the contrast between the opposites of something and nothing.

Is it possible that opposites are necessary for any awareness at all of our surroundings? Is it important to know that the *something* of stars and planets is only visible against a black background of *nothing*? This is the frame of reference (Corollary #2) used for all observations, definitions and measurements. Why has this not been pointed out? One reason it is never mentioned is because it appears so "obvious." But in this case, the obvious is not obvious and the obscurity of NOTHING distorts our understanding of reality. The existence of the nonphysical *nothing* should be as conscious a part of our thinking process as is the existence of the physical *something*.

It is said that vision is made possible by the transmission of light and the subsequent absorption of photons. But this is only half the explanation of the source of vision. It is the lack of absorption of light *alongside* its absorption that renders the contrast necessary for the awareness that comes from vision. For visual imaging it is necessary to absorb light particles alongside not absorbing light particles.

White is perceived by us through the reflection of light into the eye and black is derived from the nonreflection of light into the eye. Where there is all light alone or no light alone, there is blindness. Pilots are as fearful of landing on a field of all snow in daylight as they are of landing on an unlighted field at night. Both fields lack the contrasts necessary for the pilot to judge where the surface of the ground is. An all-black or all-white surface give us no information. Information lies in the contrast between something (photons) and nothing (no photons). Black for humans represents the nothing of no light and white represents the something of only light. We receive no light from black because black absorbs light and we receive light from white because white reflects light. By combining both the something of light and the

no light of nothing we can begin the imaging process. Humans have sight because of a binary relationship of photons (light particles) and no photons. A photograph is a mosaic of points of light and no-light organized by size and position. A printed page is the same. Color perception is derived from the relationship of light particles and the holes they fill and empty. What we perceive as color is the frequency rate at which photons fill and empty holes. The perception of color is the rate of absorption determined by the frequency rate of alternating nothings and somethings — one after the other. The *nothings* of no light in between and alongside the *somethings* of light are always necessary to perceive light. *No message* is necessary to define a *message* just as a split second of silence is necessary to define a *dit* or *dah* in a Morse code transmission.

Consider the sense of touch. If we touched something constantly, would we feel anything? When we put a ring on our finger we are immediately aware of it. You might say we have flipped a switch. Switches are on and off devices. The on and off positions identify each other because one is essential to the other. There is no such thing as half a switch. We notice the *on* of the ring because we feel it against the backdrop of the *off*. The nonphysical *off* of not sensing a ring is a necessary preparation for the contrast of the physical *on* of sensing a ring. The off and on opposites of a switch is another example of Corollary #9: *Opposites define each other and cannot stand alone; to know one is to know the other.*

After a while we no longer notice we are wearing the ring. We have lost the switching sensation. Without the contrasts between physical and nonphysical, there is no awareness. When we take the ring off our finger, the switch moves from ring on to ring off. This gives us an awareness again of the *nothing* of no ring instead of the *something* of the ring. After time, we will no longer notice the ring is off. We need to switch to the *off* of no-touch to perceive the on of touch as we need to switch to touch to perceive no-touch. The one must follow the other to gain sensitivity. The

senses work for us because of the oscillations between the nonphysical and the physical that can be expressed as off and on, empty and fill and emission and absorption.

Consider the sense of hearing. The *on* of absorption and the *off* of emission are provided by the action of sound waves. The waves are composed of a compaction of air molecules alongside a rarefaction of other molecules. Compaction and rarefaction are dependent upon each other. As always, opposites define each other (Corollary #9). To compact (absorb) to a filled state requires an accompanying act to rarefy (emit) and reach an emptied state. Rarefy (empty) defines compact (fill) and conversely. Compaction is the crest of the wave and rarefaction is the trough.

When a sound wave comes in contact with the ear, the compaction of the crest is noticeable because of the rarefaction of the trough on either side of it. Something (more molecules) is defined by the borders of nothing (fewer molecules). We are able to notice the air molecules touching our ears only because, as compacted, there is the *something* of compaction surrounded by the *nothing* of rarefaction. The more of nothing defines the borders of the more of something. If there were all crests or all troughs, there would be no differences, no borders and NO INFORMATION. This information is transferred by motion to absorption by the brain.

Taste and smell convey information by being perceived and not perceived. We sense exclusively through contrasts. Thus a strong smell seems to diminish after persisting for a few minutes without interruption. The molecules we interpret as an odor are still there, but their *absence* is gone and with it the essential off-to-on contrast. The point of maximum awareness is when the switch is flipped. All human observation, knowledge and sensitivity is a derivative of these binary physical and nonphysical contrasts.

In general terms, knowledge of anything requires a prior condition of ignorance from not knowing. The defining process for our senses comes only after our inability to *define*. Nonawareness is necessary for awareness. The reverse is also true: new knowledge allows us to acquire a new recognition of ignorance and to

reach a new non-defining stage. Ignorance is the existence of holes within the gray matter. Holes are the containers to be filled with knowledge. The empty of ignorance must always be a prior condition before the fill of knowledge.

Is the world a series of switches that pulsate between on and off? Is the *off-and-apart* phase necessary to achieve and understand the *on-and-together* phase? Does nature depend upon physical and nonphysical cycles and positive and negative fluctuations for its operation? I am confident the answer is yes.

It has been long believed that human awareness comes from the signals and messages of physical objects brought to the mind through our senses. However, the state of *not* receiving these signals is necessary for their reception. The messages and signals of absorption are determined solely by the borders of their absence. It seems somewhat paradoxical that the area of no message makes the message possible. We are immediately sensitive to where we can achieve emission and absorption because of the oscillating difference between what we receive and what we do not receive. If the absorption of something represents the signal, we can only notice it by not having a signal adjacent to the signal. A message is detectable only when it is surrounded by no message. No message is the necessary complement of a message. *Empty* is the necessary complement of a *fill*. *Off* is the necessary complement of *on*. Emission is the necessary complement of absorption. It is the nothing of no-message beside the something of a message that defines the pathway (0) for emission and the position of the hole that we use for absorption (arrival). No message gives us the awareness of nothing that enables us to use nothing to move (emission) to the message (absorption). This is a key distinction to enlarge our view of natural phenomena and to bring to us a closer approximation of reality. The conclusion is that the frame of reference for all observation lies between the physical and the nonphysical (Corollary #2).

CHAPTER 2

MATHEMATICS AND COMPUTERS

MATHEMATICS IS A POWERFUL TOOL for our exploration of the universe. But what does it represent? Thousands of years ago humans developed the mathematical counting board. The abacus — still in use today — remains the prominent example. Most counting boards use ten symbols. It has a series of columns, each column using nine beads for nine of its ten symbols. The tenth symbol is represented by the column when it is empty. Combinations of beads and no beads in successive columns allow the user to achieve rapid computations. For example, the number 306 uses the first three columns of the counting board. The first column contains three beads, the second column no beads, and the third column six beads. Numbers can be added and subtracted rapidly by simply moving the corresponding numbers of beads to their corresponding positions. The ancient counting board performs simple calculations on the same principle as today's electronic calculator.

But there was a major limitation upon the counting board's application to advanced computation. No one had converted the counting board's method of positional counting to the written symbols of positional counting that are necessary for complex computations. If you were a citizen of ancient Rome, imagine attempting to add, subtract, multiply and divide large numbers on papyrus using the Roman numeral system. To illustrate, use Roman numeral notation to square CCCVI with pen and paper.

The question is, what prevented people from translating the counting board principle into writing? The answer is that no one grasped the idea of creating a written symbol for the empty column of no beads. It is incredible that after thousands of years of hundreds of thousands of people counting millions of empty columns, no one thought of making a written equivalent of positional notation for the empty column. This was finally accomplished through the invention of the 0 which represents the empty column. Euclid, Pythagoras, Archimedes and all the other intellectuals of Greece failed to see it. The failure to see nothing and its crucial relationship to something remains a central reason we are at an impasse in our thinking on discovering fundamental explanations of reality.

What blocks our recognition of the value of nothing? It is our concentration on the physical world. In everyday life, we constantly deal with and recognize only the tangibles around us. This shapes our mode of thinking about reality.

This is not to say that our understanding and use of the physical is unimportant. The problem is, we have failed to recognize that it is only through an understanding of the nonphysical that we can make great strides in understanding the physical. Each depends upon the other. The nonphysical nothing is and will continue to be an equal partner with the physical something in shaping the cosmic events of the universe.

Finally, a long since forgotten Hindu decided to use the symbol of a dot to represent the empty column. His Hindu religion may have prepared him to do this because Hinduism recognizes the value of nothing as spatial organization created and formed by

the physical. Much later the dot was changed into the modern zero (0). The introduction of the zero transformed mathematics into its modern form and gave it its pervasive status.

The counting board deserves a closer examination because the principle behind it has a profound application not only to humans and their structured civilization, but to the entire natural world. The counting board uses the physical to construct the framework for its columns and beads. The physical rod of the column (on which the beads slide) is an example of how the physical outside surface of an object organizes the space next to it. The purpose of the columns is to give a geometrical form to the nothing around the columns to provide a place of occupation (a hole to be filled) for beads. Note that a hole was placed in the beads for occupation by the physical part of the column. The process of emission and absorption could then be used for the entering and the leaving of the beads.

Each column of nothing is designed to hold one to nine beads. The challenge is, if there are only nine beads, how can we then indicate the quantity of ten? Let's start with using only the first column. As we add more columns, we add them to the right. To use only the first column, we begin with that column in an empty state. There is nothing to fill without a previous empty. Now we place one bead after another into the first column until we reach the ninth bead. At this point we want to show ten entities that could be ten of anything. To do this we add another column to the right. To show ten of something, we place only one bead in the first column — instead of nine beads — and the second column to the right is left empty. Now the one bead in the first column indicates a column completely filled one (1) time. We know the one means a one-time fill of ten because of the emptiness of the second column to the right. This emptiness states that the first empty of the first column has now been filled. The 1 of the first column and the 0 of the second column is a salient example of the dependency of opposites. An empty (0) is necessary to determine a full (1). In this example an adjacent nothing (empty of the second column) is necessary to identify an adjacent something

which is one bead of the first column showing a column completely filled one time. If we did not use an empty second column, we would know that one bead meant just one of something in the first column and more beads could be added to the first column.

Thanks to the anonymous Hindu, we can transform the principle of the counting board to pencil and paper by expressing ten with a 1 in combination with a 0 to the right of it. Without the combination of the 1 and the 0, the 1 alone would just represent one of something (a single integer). This illustrates the necessity of introducing nothing to understand something. The 0 to the right of the 1 is saying, "I am here to let you know that I am ready to be filled again because the first 0 (the prior empty condition of the first column) is now completely filled." The written symbols showing the completely filled condition of ten of the first column is 10.

If we use two columns with two beads in the first and no beads in the second column, we can represent twenty. This can be transferred to written form with the symbols 20. The 2 means that two 0s are filled with ten each. This information is understood because the new 0 is ready to be filled to the right of the 2. The number of beads to the left counts how many 0s have been displaced by being filled. We know this because an empty second column has been introduced to the right. This is an example of something requiring nothing next to it to gain existence and recognition.

The 1 with the 0 to its right is usually thought of as ten (10) in written form. In contrast, what if the column of the counting board was designed for six beads instead of ten? When using two columns where the first column has one bead and the second column has no beads, this means the 0 of the first column is completely filled one time with only six. Now the symbols 10 in the written form would mean six of something instead of the usual ten of something. The arbitrary use of a base of ten in the Arabic

numeral system probably evolved from humans having ten fingers.

The 1 of the 10 in the written form can also represent any full container as in the full container of the counting board column. The 0 of the 10 can represent any empty (0) condition that always surrounds, identifies and is next to all full containers. As an example, the container column of the counting board may be designed for ten beads while a container pack for beer may only be designed for six beers. The 0 (empty column) of the counting board container takes ten and the 0 of the beer container takes six. The filled (1) six-pack of beer and the nothing (0) which is next to and surrounds this filled condition can also be referred to in writing as 10. Now instead of ten of something the symbol 10 means six of something (beers). All full containers in nature can be represented by 10.

It is important to emphasize that the 0 represents an empty container. If the 0 is designed for 8 of something and we write the symbol 4 by itself, we know the 0 is only half full and has room for 4 more of something. The value of the invention of the 0 and 1 designations is to fill (1) and to empty holes (0) on a writing surface. Now we can add, subtract, multiply and divide physical objects with a pencil or pen without getting involved with their actual physical manipulation. Learning to count with numerical symbols on paper led us to greater success in filling and emptying real objects represented by those symbols. The use of nothing is crucial in mathematics for the same reason that nothing is the frame of reference (corollary #2) for not only our observations, but also for the transportation of physical objects. Nothing is crucial for all universal action. The 0 in written form records the nothing (holes) used by nature's physical entities.

The 0 in the numeral 10 describes the empty condition next to all completely filled conditions. The 10 is written to represent containers that are completely filled. However, to interpret nature through our senses, we always require an empty (0) in contrast to

the physical (1) in understanding any object. Even on the printed page, a 1 written by itself needs space (0) around and next to it to observe its identity.

The central premise here is that the zero in mathematics is a hole used in transporting numerals (representing anything we want) from one place to another. The 0 enables us to represent emission and absorption on paper. We move things represented by numbers in and out of a hole indicated by a 0. This symbolic representation mimics nature. The power of mathematics is in its use of the same emission and absorption principles that form the basis for all natural processes and events. More complex forms of mathematics merely use different symbols and methods for departure and arrival processes that are also found throughout nature.

The Romans used the symbol X to represent ten somethings, but with the introduction of the 0, the Roman numeral system was rendered obsolete. The 10 notation represents ten of something. Whatever the size the 0 is designed for, the 10 is saying that we have a one-time filling of the first hole (0) because of the emergence of a new hole next to it. If the base (size of 0) is six, then the 0 is designed for six of something and "10" would then represent six of something. The arbitrary decision on the size of the hole (the size of 0) is infinite.

The important point is that the underlying foundation of the Arabic numeral system and mathematics involves the use of the 1 and the 0, that is, the physical (1) and the nonphysical (0). The numerals 2, 3, 4, 5, 6, 7, 8, 9, are single integers that each express how many 1s are being used. The principle is the same with whatever base we choose and all base systems have the 1 and the 0 as their foundation.

We can even create a base of 1. To use a base of 1 the zero is designed to be filled only by a one (1) of something. In this example when we write a 10, it would mean the container (0) can only accommodate a single 1. With a base 1, however, it would be unnecessary to use a 0 to the right because a 1 is all there is within the base 1. There is no need to place a 0 next to the 1 because the 1 by itself says it all. By design we already know this

is all we can use. It can be argued, "Isn't this an example of not having to use the 0 because the 1 of something has no necessity of the 0 of nothing?" "Isn't this a case where binary (0-and-1) relations do not apply and the 1 can stand alone?" To show that all numeral base systems use the 0-and-1 as their underlying principle, the 0 must somehow be used. The purpose of any piece of writing paper is to organize the 0 of its surface for filling with words, numbers, pictures or whatever is desired. When writing a 1, the physical ink (the 1) does not occupy the physical paper, it displaces the space (0) on its surface. To place a physical entity anywhere requires a hole. Similarly, alphabetic letters need spaces and holes between them so we can distinguish them. Words need even more space to distinguish them. Writing the 1 by itself is not possible, if "by itself" means without the 0. The vertical slash mark of a 1 not only fills a container (0) hole (the 0 of the writing surface), but it is also identified by the nothing that surrounds it. A useful instructional challenge is to try to identify anything involved with your observations or actions that does not require the use of both the 1 (physical) and the 0 (nonphysical). To use the 1 of anything means accomplishing an emission-to-absorption phase that requires the use of the 0. To write a 1 on a sheet of paper is an emission process for the ink being absorbed by the hole that is organized by the surface of the paper.

The base of 1 is a natural conclusion when there is the in-depth analysis of the 0. Is the base 1 revealed in mathematical texts? It seems simple by itself but it is not simple to recognize its relationship with everything else. The more useful a principle is, the simpler it is. We add to knowledge by making less explain more. The complexity of nature is structural — how things are put together — but the underlying binary (0-and-1) principle governing the building process is simple. The base 1 has limited usage in mathematics. It is used here to demonstrate the principle that a physical's existence — a place for an object to occupy — depends on the prior existence of the nonphysical hole. And, the recognition of something (1) comes from being surrounded by nothing (0).

The 0's circular shape is ideal for a holes description. It is the physical nature of ink, chalk and pencil surrounding nothing (0) that defines nothing. Something defines nothing and nothing defines something. The physical circle of the 0 encloses the nonphysical space inside. The physical surrounds the nonphysical, creating the circular shape, and is complete in organizing the empty space into a hole represented by a circle — in this example, the zero (0). In three dimensions, more physical boundaries will better organize the nonphysical. Within the limits of writing paper and its two dimensions, it is difficult to imagine a more appropriate symbol for this information than the 0. We point to nothing by completely enclosing it with something.

The physical slash symbolizing the numeral 1 is opposite the 0. The nonphysical completely surrounds and defines the physical. Both the 0 and the 1 are defined by the boundaries of each other (Corollary #1). Consider the example of a tree standing in a forest compared to a tree standing in a clearing. In which of these scenes does a tree stand out and command our attention? Not surprisingly, the tree in the clearing is the standout. The lone tree stands in sharp contrast to the emptiness of no trees (the clearing). Similarly, think of a meadow (0) surrounded by a forest (1), compared to a meadow surrounded by other meadows. The physical part of the forest defines these spaces better because it surrounds it. Understanding the 0 and 1 frames of reference for our observations sensitizes us to the importance of contrasting opposites. Realizing this binary principle will add greatly to the meaning behind our observations.

We use mathematics to solve problems. Problems always reveal ignorance (lack of information and knowledge) that represent empty holes to be filled. Once aware of these holes of ignorance, we can seek to fill them with useful knowledge. The mathematician begins the solution to his problems through the emission of equation combinations that comprise previous states of knowledge. This motional development of the mathematical equation is analogous to the necessity of finding unknown pathways for the arrival of solutions (answers). The question (0) leads

to the answer (1) of absorption through the phase of emission. Any question is a 0 waiting to be answered with a 1. The mental absorption of a solution can provide the knowledge for emission and absorption for us. When our body successfully occupies space, this indicates a prior successful occupation of space in the mind.

As children, we were taught that when we subtract 2 somethings from 4 somethings, we are left with 2 somethings. However, when we remove a 1 of something, we always leave a 0 behind. Is it important to understand that the removal (subtraction) of a filled (1) condition leaves behind an empty (0) condition? When we subtract something we add nothing. To advance our understanding of something we must be cognizant of the position of the organized nothing (0) as we are cognizant of the organized something (1). To learn this early in life can give us a great advantage in how we both approach and solve problems. When the 2 of something is subtracted from the 4 of something we are left with the 2 of something and the 2 of nothing. As we subtract objects we add the 0 of no objects and as we add objects we subtract the 0 of no objects.

In the following chapters, the symbol 1 will be used to indicate the physical and in contrast, the symbol 0 will be used to indicate the nonphysical. The 0 indicates nothing and the 1 indicates something.

COMPUTERS

In only half a century, the digital computer has become a prime mover and organizer of human civilization. The modern computer is built upon the ancient principle of the counting board. The counting board manipulates a series of 0s defined by the columns that are created to emit and absorb the 1s of beads. The computer manipulates a series of 0s (semi-conductors) defined by the 1s of atomic structure that are created to emit and absorb the 1s of electrons. The organized emission of electrons by the cathode ray tube and absorption of those electrons by the computer screen forms alphanumeric characters and pictures.

These electron combinations give us the physical appearance of data which is seen in contrast to the nonphysical surrounding the physical. The digital computer is based upon the binary system of 0 and 1 that is manipulated by an ingeniously designed series of switches. Like all switches, they can be switched to either the on (1) or off (0) position. Computer electronics manipulates the mathematical base of 2, which requires only the 0 and 1 for its numerical designations. In the base-2 system, the 0's size is for the 2 of something. In binary notation of base-2 the symbol 10 (one zero) means two instead of ten.

The basis of the computer, however, is not the 2 of something. It follows the binary principle of 0 and 1 behind all base systems, mathematics and natural phenomena. The digital computer is a binary tool because it uses two opposite concepts: the hole and the electron which fills (1) and empties (0) the hole. The binary (0-and-1) act as pairs to create the absorber (hole) for the absorption and emission of electrons. The computer is commonly thought of as unique in its binary applications; however, a purpose of this work is to reveal the universality of binary (0-and-1) relationships and applications.

The off is the emergence of the 0 and the on is the emergence of the 1. All information can be represented with this power-on (1) and power-off (0) principle. The computer follows the same rules of nature that govern all emission and absorption events. Only the structures are different. As will be shown, humans and the civilizations they build must also have this binary 0-and-1 base to attain viability, stability and durability.

CHAPTER 3

ELECTROMAGNETIC PHENOMENA

BENJAMIN FRANKLIN, PRINTER, diplomat and American icon, found time in his busy career to make major discoveries and innovations in electrostatics. Let us determine if they follow this binary 0-and-1 pattern. During Franklin's time, it was believed there were two types of electricity. If one silk cloth was rubbed on glass and another silk cloth was rubbed on amber and then both cloths were brought close together, the two silk cloths were attracted to each other and clung together. Similarly if two silk cloths were rubbed on glass and then brought close together, they repelled each other and moved apart. The same repulsion effect occurred when two silk cloths were rubbed against amber. It was postulated there were two types of electricity, one involved with glass (vitreous) and the other with amber (resinous).

Franklin noticed that after a time, these attraction and repulsion effects disappeared and the silk cloths returned to their usual position with respect to each other. From this observation he came to the conclusion there was only one

type of electricity. Franklin reasoned that when silk cloths were rubbed, one of the substances (glass or amber) gained an excess of this electricity and the other was left with a deficit. The one with the deficit had transferred an excess to the silk cloth; the one with the excess had transferred a deficit to the other silk cloth. Franklin stated that after the two cloths came together in the attraction phase, each would eventually discharge and return to a balance of only one kind of electricity. For this reason they separated and returned to their usual distance. And the repulsion effects ended for the same reason.

Franklin concluded that *excess* and *deficit* attract each other and two excesses or two deficits repel each other. He coined the term "positive" for the excess and "negative" for the deficit. It seems obvious — two and a half centuries later — why he did so. The excess of electricity is a *positive addition* process and the deficit of electricity is a *negative subtraction* process.

More than a century after Franklin's discoveries, it was learned that this single type of electricity represented particles of electrons. Franklin had no idea which material (glass or amber) had the excess and which had the deficit. He guessed with a fifty-fifty probability of being right. Much later it was found that he had guessed wrong. The excess electrons were at the negative pole instead of the positive pole as Franklin had intended. But instead of changing the sign to correspond with reality, convention prevailed. It was reasoned that as long as electricians used the same nomenclature, the misnomer would still work for them. Even today, electricians are taught that the electron is at the positive pole; however, scientists discovered long after Franklin that electrons were at the negative pole. Franklin's concept of an excess positive addition is now understood in physics to be a negative charge and his deficit negative subtraction concept is now a positive charge.

This creates a major problem in how we view nature. Consider the years that science students have looked at these designations in reverse, calling a subtraction (a deficit) positive and an addition (an excess) negative. This misnomer obscures the symmetry of

nature. Subconsciously, we are blinded to the simplicity and the true meaning of *positive* and *negative* within the electromagnetic discipline. This limits us in our ability to carry this binary symmetry into other areas of nature. The terms positive and negative have become misleading and meaningless electromechanical identifiers. This causes us to miss the elegance of nature's underlying binary (0-and-1) principle.

Rubbing the silk generates the extra energy necessary for the electron to move from one place to another. It was the glass that emitted electrons and caused absorption on the silk. Amber absorbed the electrons emitted from the silk. After rubbing the glass, the glass then has a deficit of electrons and amber an excess. What is left when an electron leaves? The glass now has an EXCESS of holes (where electrons used to reside) and glass also has a DEFICIT of electrons. Amber now has a deficit of holes and an excess of electrons. Notice that in considering the organized spaces as well as electrons, we have a duality of excess (1) and deficit (0) within each object (amber and glass). Thus we are concentrating on both the physical (electron) and the nonphysical (hole).

What does this mean? Could the same thing be happening "down there" at the atomic level as it is "up here" at the human level? As individuals we are continually fluctuating between charged states. An example is the negative state of hunger (0) that attracts us to the positive charge of food (1). The only difference in holes at the atomic level and the individual level is the size, shape and form of the holes and what fills and empties the holes.

Physicists know how these positive and negative electric charges act and can measure the size of the charges, but they do not say anything about what they actually represent. They know the electron is somehow a part of one charge, but they can say nothing about the other charge. I have concluded that we can now comprehend what charges are by making the hole an entity along with the electron which oscillates in and out of the hole. The negative charge is the 0 of the empty condition and the positive charge is the 1 (electron) of the filled condition. Before

absorption, the absorber is in a negative empty condition and before emission the absorber is in a filled positive condition. Those objects absorbing electrons change to a positively charged state and those objects emitting electrons change to a negatively charged state.

We can also extend the concepts of absorption and emission to holes as well as to the physical entities that fill and empty the holes. The deficit (0) can also be thought of as being absorbed and emitted. In other words, we can say that when the 1 is absorbed a 0 is emitted and when the 0 is absorbed a 1 is emitted. It would seem that the 0 is incapable of being absorbed and emitted; however, this is possible because the 0 is a viable entity unto itself. The exchange and interaction that the emitted and absorbed object creates between the emitter and absorber is an exchange between the 0-and-1. That which is emptied and that which is filled have changed positions. The body that absorbs and the body that emits change charges. Emission for an object is moving from a positive (+) charge to a negative (-) charge and absorption for an object is moving from a negative (-) charge to a positive (+) charge. Our quest for answers should be equally directed toward both the 0 and the 1 which gives *something* and *nothing* equal status.

In explaining electrical charges we must show the forces that cause the attraction and repulsion effects of electrical phenomena. Is it the 0s' and 1s' affinity toward each other that causes the force of attraction? Does the 0 "want" to be filled and does the 1 "want" to perform the fill? Is it the excess of 1s in both silk bodies and the excess of 0s in both silk bodies that causes repulsion? Is it because there is no possibility of occupation that they move away from each other? If both 1s and 0s are conserved (Corollary #7) then it is obvious (after the fact) that a 0 cannot displace a 0 and a 1 cannot displace a 1. If this were the case, then we would have the elimination of the 0-and-1, an unimaginable event that has not been seen in nature. Instead, 1s move toward the 0 where they can naturally flow and away from other 1s where they cannot flow.

ATTRACTION AND REPULSION FORCES

In the preface to his landmark treatise, *Principia Mathematica,*[1] Isaac Newton reveals his optimism for a "truer method of philosophy."

> I wish we could derive the rest of the phenomena of Nature by the same kind of reasoning from mechanical principles, for I am induced by many reasons to suspect that they may all depend upon certain forces by which the particles of bodies, by some causes hitherto unknown, are either mutually impelled towards one another, and cohere in regular figures, or are repelled and recede from one another. These forces being unknown, philosophers have hitherto attempted the search of Nature in vain; but I hope the principles here laid down will afford some light either to this or some truer method of philosophy.

Newton admitted he could not explain *why* bodies want to come together and adhere and *why* they repel and recede from one another. Instead he concentrated on describing how physical bodies could be expected to react with one another through their motion, never mind why they did so. For Newton, forces existed but could not be identified.

This concentration on the physical alone and its reaction to unknown forces worked well enough until we entered the era of quantum physics. From my view, the emergence of Quantum Mechanics and our focus on the physical has caused a crisis in our interpretations of reality. We can no longer afford to view nature in the context of the physical alone. In contrast, some have said that within the atomic domain we cannot even view nature at all. Many within the physics community would pull down a curtain that covers explanations of nature by denying causality and a one-to-one correspondence with reality in the microcosm. In so doing,

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[1] *Newton's Principia a Revision of Motte's Translation,*1934. Newton's preface to the first edition, May 8, 1686. Cajori: University of California Press, London. Page XVIII.

they have instituted one set of rules for the microcosm and another set for the macrocosm.

If we are going to continue postulating a universe governed by cause-and-effect, we must explain these forces of nature. With amazing foresight, Newton recognized this problem and alluded to the direction — the why of motion toward objects and the why of motion away from objects — we must go to achieve a "truer method of philosophy." I believe that direction lies toward identifying the *why* of the *apart phase* and the *together phase:* the *why* of emission and absorption.

When we are hungry, our body is in a negative and empty state that attracts us to food causing us to move toward the food that will bring us back to a full and positive state. This represents the empty 0 of the human body having access to the 1 of food. Similarly the 0s (empty) of one silk cloth are attracted to the 1s (filled) of the other silk cloth and conversely the 1s are attracted to the 0s. If in search of food we find the refrigerator in an empty negative state, we are repelled away from it by our attempt to find the positive (food). This is an empty (0) confronting an empty (0) and being repulsed by it. Similarly, the two silk cloths repelled each other due to the deficit (0) of electrons in each.

Can a filled (1) condition also repulse another filled (1) condition? If we move to any container to fill it and discover it already full, we are repulsed away toward a container in an empty condition. We may conclude that a 0-on-0 and a 1-on-1 encounter results in a repulsion effect. This is occurring in the microcosm and macrocosm for the same reason. Do humans use the repulsion force at a distance in the same way the silk cloths repelled keeping a distance between them? When our stomachs are full we tend to keep a distance from the refrigerator knowing our filled (1) condition cannot achieve another fill (1). When we move through the halls (holes) of our house, we naturally keep a safe distance from the physical walls that define our hallways (0). This repulsion — 1 of humans to 1 of walls — at a distance is learned by the hard knocks that warn us where we can and cannot safely

go. Where we cannot go becomes our guide in directing us to where we can go.

While driving the highways, a deadly repulsion effect can occur if we trespass beyond the borders of the road that keep us at a safe distance. We move away from the highway borders because we recognize the danger of a collision. The collision we avoid is between the 1 of the border and the 1 of the car. This is a 1-on-1 of repulsion. What causes us to move away from danger and keep a safe distance is the same principle that causes two silk cloths with an excess of electrons (1-on-1) to move a distance from each other. When where we cannot go becomes powerful enough, we move further away to better maintain the direction of where we can go. Do repulsion effects at the atomic level occur for the same reason they do at the human level? I am suggesting that the binary concept of the 0 and 1 can explain the forces humans use and electric charges use for motion *away* and *toward*. The why of the apart phase is the repulsion (0-on-0 and 1-on-1) force and the why of the together phase is the attraction (0-to-1 and 1-to-0) force. The same forces are at work in the microcosm and the macrocosm.

Attraction is derived from the availability of the 1 and the 0 for each other. The positive 1 is attracted to the negative 0 and the negative 0 is attracted to the positive 1. A 0 can move to a fixed 1 and a 1 can move to a fixed 0, or they can both move toward each other.

How does a 0 move to a 1? When a truck is empty (0), it uses its physical framework and energy of motion to move its emptiness toward the 1 of the full warehouse. In the same way humans move their 0s toward the filled refrigerator. When the 0 arrives at the 1, then the 1 can move to displace the 0. This can be generalized to all human action and the tools we use to aid our emission (0) and absorption (1) phases. The oscillating 0s and 1s of humans are oscillating negative and positive charges. The same principle is applicable to the oscillating 0s and 1s of negative and positive electrical charges. All of nature's fluctuations are between these binary processes.

My conclusion is that the physical sciences have missed discovering the fundamental basis of physical phenomena because physicists have subconsciously isolated the physical from the nonphysical. Newtonian mechanics concentrated on matter. To solve our present problems we need to apply equal concentration on the nonphysical. It may appear that the physical world moves because of an attraction to other physical objects. In reality, when we conclude that the nonphysical 0 is organized and sculptured by the physical (1), it follows that the attraction between objects is an attraction of the 1s of each object to the 0s of each object and the 0s of each to the 1s of each. The motion (emission) resulting from this attraction acts with precision because the repulsion force (0-on-0 and 1-on-1) guides this attraction force (0-to-1 and 1-to-0). Everything, including ourselves, "knows" where to go because it knows where it cannot go.

CHAPTER 4

Possible (0-to-1 and 1-to-0) and Impossible (0-on-0 and 1-on-1)

Opposites Are Not Only Dependent upon Each Other, They Also Define Each Other.[1]

IF THE BASE FOR ALL OPPOSITES comes from the interdependent binary 0-and-1, then it naturally follows that all opposites are also dependent upon each other. This dependency means that we can define and understand one of a pair of opposites only because we have defined and understood the other one. Neither can stand alone.

Instead of trying to make nature match one opposite or the other, we should approach problems with the understanding that nature always uses both opposites. Instead of wanting only the good (positive), we should realize that nature oscillates between both "good" and "bad", positive and negative. Knowledge and learning come from definitions perceived by the nondefined stage of ignorance as a necessary prior condition. If we have trouble defining one

[1] See Corollaries 1, 8, and 9.

concept, it is often because we have not defined the opposite concept. This is important because the foundation of all nature and all action is an antonymic base. This gives us the symmetry necessary for understanding.

As opposites, possible and impossible relate to the 0-and-1 and are defined through the force of attraction and repulsion. How many times in history has the seemingly impossible spurred the creation of the possible? How many problems are there today that we deem impossible to solve that are in reality quite possible? Would it be important to know the difference between possible and impossible? To know the difference, we need a better understanding of this salient pair of opposites.

The impossible is defined as the repulsion effect of nature that does not allow us to proceed. In other words, the emission phase is not possible. This is precisely because our physical (1) cannot be absorbed by another physical (1) and our spatial arrangements (0) cannot be displaced to reach absorption through another spatial form (another 0). This is the only thing preventing our successful arrival at a new location.

For example, we know from experience that when any tangible part of us attempts to occupy another tangible, this can lead to a disaster. A catastrophic encounter can change our physical structure to the point where it will cease to oscillate — which means cease to live. Or we can destroy the spaces within us so the spaces cannot fill and empty again. This is death! When we fail to find air to breathe or food to eat, this means our internal 0s are confronted with external 0s. "Bad" things of life arrive when blocked pathways lead to the inability to fill our spaces (absorb). We lose access to the possible when the 0 and 1 are unavailable for each other. Attraction is the availability of the 1-and-0 for our emission and absorption stages necessary for life.

Does this mean that we should only have the possible and eliminate the impossible (force of repulsion)? In keeping with the mutual dependency of opposites, we must use both repulsion and attraction for achieving the possible. The impossible is used as a springboard to reach the possible.

As children we were constantly testing this force of repulsion. We got a lot of hard knocks before we began to understand where we could not go. What did this do for us? We used this knowledge of repulsion to understand the impossible, which guided us to the possible. Since we cannot know everything, we are continually confronted by the problem of finding the pathway for our emission-to-absorption processes. The pathway of the possible (attraction) is defined by using the impossible (repulsion) as a border for seeing and understanding the 0 of where the 1 can go.

Problems in life are problems of how to deal with the force of repulsion. The value of a problem is the opportunity to recognize the repulsion force and then to use it in guiding us to the solution — to the positive of absorption.

The act of walking is an example. We use the surface of the ground, and its repulsion of our physical feet, to push us forward into a step. This is an example of learning from where we cannot go to get to where we can go.

This direct use of repulsion illustrates Newton's third law of motion. When the 1 of us pushes against the 1 of something else, we get pushed back by the same force. This is the 1-on-1 part of the force of repulsion. Without it we could not reach the stage of emission or absorption. We use this force to achieve motion and to achieve absorption and arrival. We push where we cannot go to propel us to the 0 of where we can go, and upon arrival we have used where we cannot go to stop our motion. When we sit in a chair, we occupy its space and use its physical parts to halt our motion in a sitting position. A container uses its physical framework to do the containing. Containment uses the force of repulsion. There is no point in going somewhere if we do not have the means to contain ourselves when we get there.

When using the 1-on-1 of an object relative to another object for demonstrating repulsion it should be understood that the 0-on-0 of objects is also involved. The physical (1) container's repulsion against our physical (1) body shows only one side of repulsion. The other side of repulsion is the 0-on-0, which is

necessarily involved because the bodies of all objects are both 0-and-1. What may appear to only be the physical of an object is in reality a composite of combinations of 0s and 1s at the microcosmic level. When any object is being contained by another object it is simultaneous expression of a 1-on-1 and a 0-on-0 repulsion effect.

Nature gives us the impossible to reach the possible. We pay our dues in life when the problems of repulsion do not allow us to go where we want, but that lets us see how to use repulsion to go where we want. Upon banging our heads against a brick wall we gain greater knowledge of where we can go safely without pain.

In a forest, the farmer has little room to plant his crops. Repulsion is rampant. So he clears the land using the trees to build a barn. The farmer uses repulsion and the impossibility of the forest to build the possibility of the barn. But the problem of the forest was necessary to reach the solution of the farm.

If all we want are solutions, we are in the wrong universe. To get to a solution, we must first identify the problem. In a like manner, questions are necessary as prior conditions to answers. The value in what we "dislike" is in leading us to what we like. Anyone can observe that the "bad" things in life can be used to learn how to reach the "good" things in life. Understanding this principle leads to a more positive outlook on life. Instead of dwelling on the impossible, use the impossible as a springboard to the possible. The impossible can be used as a tool for learning. This is how we can learn to accept ourselves and achieve greater self-confidence. The confidence to accept that making mistakes and being wrong is unavoidable and part of what we are. The confidence to embrace the negative of a problem as an opportunity to gain the positive solution of knowledge. Imagine how one's self-reliance can increase when it is realized that the problem of the impossible is necessary to use the possible in reaching a solution. Human progress is dependent upon problems for reaching solutions.

How often do people blame other people or other things for blocking the attainment of their goals? It is commonly believed that if this person or that thing would stay out of my way, then I would have the possibility of the motion necessary to reach my goals. "If this person would just stop impeding my progress I could get on with my life." People wait for the blockage to get out of the way. But each individual can change the impossible to the possible by creating 0s for his 1s and 1s for his 0s.

Nature provides your problems for your solutions. By confronting these problems we achieve knowledge and growth along with a sense of self-worth. When someone else, however, solves our problems, then the problem solver is the one who has made progress, not us. Waiting for others to change their ways is like waiting for a brick wall to get out of our way. And if by some "miracle" the wall moves out of our way, we have learned nothing and gained nothing.

Instead, success will be found by moving to where the possible will happen. Use the obstruction as a guide to motion instead of as a stoppage. This is the way nature intended us to live; this is the way all creatures live. The impossible is always our only guide to the possible.

An airplane's generation of lift is a useful example of how we use the impossible to get to the possible. The shape of the wings provides lift. The bottom part of the wing is "flat" with a curved top. The curve provides greater surface area for the molecules in the air to encounter. As the plane moves forward, both the bottom and top wing surfaces come in contact with the same number of air molecules. Because there is greater surface exposure on the top, the same number of particles move further apart than on the bottom. More space between them creates a partial vacuum (0) with respect to the amount of space between molecules above this vacuum. The vacuum (0) creates the lift.

The physical part of the air molecules cannot enter the physical part of the curved surface of the upper part of the wing. This encounter between the two is a 1-on-1 encounter with the physical part of the force of repulsion. It demonstrates the use of the

impossible. This forces the air molecules to occupy the space (0) next to this surface. Where they cannot go guides where they can go. The molecules use attraction from repulsion to take the only pathway (0 next to 1 of wing) that allows occupation. The impossible guides the possible.

The greater distance between molecules on the top surface than on the bottom creates a greater empty, deficit and negative condition. Wherever there is a deficit (negative) there is an adjacent *excess* (positive). The deficit (0) of molecules at the top surface of the wing is in contrast to the excess (1) positive and greater filled condition for molecules above this deficit. This results in attraction between more of a 0 next to the wing and more of a 1 above it. These 0s and 1s "want" to create a discharge to return to a balance between 0s and 1s. Due to the plane's forward motion, the negative condition on the wing is recreated continuously as it comes in contact with new molecules. The shape of the wing with its motion does not allow the 1s above to fill the 0s below. The 0s below also "try" to move up toward the 1s above and this creates aerodynamic lift. .

Because the 0s have been created by the curved surface of the wing, they have literally become a part of the wing. They are joined together because they depend upon one another: The 1 of the wing is dependent upon the 0s that define it and conversely. The 0 is a part of the airplane precisely because without it the airplane could not fly (it could not have lift). Because the wing is attached to the fuselage, when the 0s next to the surface of the wing move up in an attempt to be filled by the 1s of molecules, the fuselage will move with it. This lift will continue because the forward motion of the airplane keeps this positive (1) and negative (0) attraction intact.

The 0s attached to and part of the airplane create an upward emission of the airplane in an attempt to reach absorption with the 1s of the air molecules above. A balance and discharge between 0s and 1s will occur when the airplane has landed and reached a state of absorption by the Tarmac. Lift will not occur without this positive charge of an excess and negative charge of a

deficit condition brought about by the airplane's forward motion. This forward motion is propelled by the engines which also incorporate repulsion forces (by the impossible) and attraction forces (to the possible).

A sailboat sails on the same principle. The curved forward part of the sail creates the same type of vacuum (0) as the top of the airplane wing. A part of the vessel's forward motion comes from its being pulled forward in the same way the airplane is pulled up. The physical part of the sail cannot occupy the physical part of the air molecules — an impossibility — thus, the impossible guides the possible.[2]

The full (1) warehouse also pulls the empty (0) truck to it. To be sure, it is really people who are responsible for the filling and emptying of the warehouse and truck. People are pulled to act because of the 0s and 1s involved with attraction and repulsion. They (truck and warehouse) help in our survival the same way our arms and legs help in survival. The difference between arms and legs and the tools man uses for his emission and absorption is that he cannot remove them and put them away when he is through with them. But human appendages and tools are similar in the sense that they are used to attain emission and absorption.

The holes that are an integral part of the physical warehouse, truck, airplane and sailing vessel are dependent upon each other for their existence. These structures could never be built without these built-in spaces for absorption through emission. Holes are necessary parts for the viability (Corollary #4) and integrity of all systems from the microcosm to the macrocosm. Because the 1s of the warehouse cannot move to the truck, the 0 of the truck moves to the 1s. The filled truck moves to the 0 of the retail store. Then humans purchase goods (1) to fill their spaces (0). There are continual oscillations between exchanges of the 0 for the 1 and the 1 for the 0.

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[2] Possible — physical of air molecules (1) can occupy curved space (0) next to the sail.

When an 18-wheeler passes a small car driving in the opposite direction, there are reactions flowing from a continuous change between 0s and 1s. The forward motion of the physical part of the truck (1) competes with the air molecules' use of the 0. As air molecules are pushed aside, this excess comes in contact with the car driving in the opposite direction. The driver of the small car feels a lurch away from the truck as the excess molecules hit the car with repulsion. The force of repulsion transfers the motion of the molecules to the car, which causes the car to move to the 0 which it can occupy.

At the rear of the truck, there is an opposite effect. Instead of the truck's forward filling (1) and entering, we have behind the truck's emptying (0) and leaving. As the truck empties the space (0) behind, it takes time for the air molecules to fill this 0. Because of the motion of the truck, the 0 of the empty behind is renewed constantly and in effect the 0 follows and is part of the area behind the truck. This is a creation of a vacuum. The motion of the truck or of any object is the 1 of an excess (1 replacing a 0) created forward and a deficit (0 replacing a 1) created behind the object. A continuous positive condition is created as the 1 of the truck displaces the 0 in front, and a continuous negative condition is created by the empty (0) behind the truck (1).

When the car passes the rear of the truck, the driver feels his car lurch toward the hole behind the truck. The car first lurches away from and then toward the truck. The hole behind the truck produces a vacuum and the 1 of the car responds by trying to enter the vacuum (0). This shows the interaction of the two forces: first the effects of the 1-on-1 part of *repulsion* at the front of the truck and then the effects of the 1-to-0 of *attraction* at the back of the truck. The larger mass of the truck with its larger resulting hole means that the car will be pushed away at the front of the truck and pulled toward the hole in back.

The 0 of the truck is also attracted to the 1 of the car. The 1 of the car and the 1 of the truck each attracts the 0 of the other. The car's motion also produces a 1 effect and a 0 effect behind the car.

This interchange of 0 and 1 is fundamental to all objects in motion. A significant question arises: could this explain magnetic effects?

A current of electricity represents the motion of electrons and this produces a magnetic effect around the wire conducting the electrons. Placing the magnetic needle of a compass next to this current will cause the needle to move. A magnet itself is said to be an expression of motion in the same direction within the atomic structure that is part of the makeup of the magnetic needle. Notice the duality of a north and south pole of a magnet. Are these two poles an expression of motion's alignment of 0s and 1s in the same direction? If a truck's motion always aligns its 1s and 0s in the same way, then why cannot electrons do so in a current where their motion is in the same direction? Is motion the physical part of an object's use of the pathway of nothing that changes the 0 forward to a 1 and at the same time a 1 to a 0 behind? Is the magnet an expression of the same direction of motion — its internal atomic motion — and does this show us the empty, deficit and negative at one pole, and the full, excess, and positive at the other pole? Is a magnet another expression of this binary (0 and 1) foundation of nature? Is all physical motion demonstrating the changing relationship of a 0 to a 1 forward and a 1 to a 0 behind? The homogenous motion of a magnet with its pole duality reinforces to me the prospect of a binary universe that operates on a matrix of 0s and 1s. This will be added to in a future chapter.

We become aware of absorption after emission when this continuous change between the 1 and the medium (0) it uses for emission comes to a halt. Then, the continuous emergence of 0s *behind* and the disappearance of 0s *forward* is discontinued upon arrival. Therefore, emission (continuous) defines absorption and absorption (discontinuous) defines emission. The continuous nature of motion defines nonmotion and the discontinuous nature of nonmotion defines motion. Continuous defines discontinuous and conversely. If opposites occurred simultaneously they could not define each other. There could be no sensing of a difference (contrast necessary for using our senses) if they were able to

occur at the same instant. We can now say that emission and absorption are opposites and define each other with respect to the way the physical uses the nonphysical.

I will now move to the arena of natural philosophy as it relates to science and technology. This same picture will be used to solve some of the paradoxes that seem to defy explanations. The same binary 0-and-1 principles for humans and biological processes will apply to the world of physics. I will show this relationship to be a corroboration of the rightness of this new view of nature. A better view of nature provides a better foundation for integration. My obsession with these ideas began with the realization that the same rules and concepts apply to both the animate and inanimate worlds. This for me was a most compelling evidence for validation.

CHAPTER 5

ZENO'S PARADOXES

PARADOXES ARE thought experiments which show that certain ideas we commonly accept as true are logically self-contradictory. The Greek philosopher Zeno pronounced his classic paradoxes some 2500 years ago. Since then they have defied a clear solution. Some claim there are mathematical solutions to Zeno's paradoxes and others claim these solutions are unimportant because the paradoxes are fallacious. I believe they are true paradoxes that have come about because of incorrect ideas on how to interpret MOTION. All paradoxes are involved with our limited knowledge of how to interpret nature. The aim here is to replace these paradoxes with improved approximations of reality.

The reader can be the judge. Zeno uses simple words to describe his paradoxes, so let's use simple words for their solution.

The failure to explain Zeno's paradoxes is at the heart of the reality crisis in physics. It is remarkable that after 2500 years they remain unanswered. I will show that these paradoxes follow from our erroneous view of motion.

ZENO'S FIRST PARADOX

This paradox is about a runner who is ready to start a race. In order to finish the race, the runner must first go half the distance to the finish line. But to go halfway, he must go halfway to the first halfway point and before that he must go another halfway and on and on. There is always another halfway point to reach whatever the distance of the race. This means there is an infinity of halfway points to reach before the runner can finish the race. The runner spends all his time motionless because he cannot come to that first halfway point. In reality the runner does get started and he has forward motion. But what is wrong with our perception of the paradox? Zeno knew his paradoxes did not describe reality. He challenged us, however, to explain why they were paradoxical.

ZENO'S SECOND PARADOX

This paradox involves a race between the speedy Achilles and the much slower tortoise. The tortoise is given a head start and the challenge is for Achilles to catch and pass the tortoise. Zeno points out that every time Achilles arrives at a point from which the tortoise has departed, the tortoise has moved farther on. Wherever the tortoise is, by the time Achilles gets there the tortoise has moved farther on again. Because of this, Zeno argues, Achilles can never catch the tortoise.

We are involved again with an infinity of distances between the departure of the tortoise and the arrival of Achilles. The tortoise is always some distance ahead because Zeno always requires Achilles to arrive at a fixed point from which the tortoise has just departed. No matter how short the distance, the tortoise will have moved every time Achilles reaches the tortoise's new point of departure. However, in reality Achilles does pass the tortoise, therefore where have we gone astray in how we perceive motion?

ZENO'S THIRD PARADOX

This third paradox involves the motion of the arrow in flight. Zeno insists that if the arrow occupies a specific location at any instant, then at any instant the arrow cannot be moving. Anything occupying a place must be at rest. Since the instant of being somewhere can be any instant along the path of motion, then it is presumably clear that the arrow cannot be moving. But the observed arrow does move with respect to the observer. Has our perception of motion failed to approach the reality of motion?

Zeno insists that objects are either continually moving or they are continually at rest. If an object occupies a specific place, then it is at rest. If it is moving, it is always out of a specific place.

Herein lies the deception in the paradoxes. Reason tells us that something must be somewhere even while it is in motion. But to provide a place for something in motion is to identify that place. The place must be measurable. To measure its location, there must be a specific unchanging location for the object in motion. Yet this cannot be because a specific unchanging location indicates a state of rest for the object and hence nonmotion.

The points of position that Zeno places on the pathways of motion are the same points of position we place on the pathways of motion to understand motion and where objects in motion will be at any given time. The moon and earth are in continuous motion and yet it is important to identify their relative positions to know where they will be. For example, due to the influence of the moon upon tidal changes, it is important to know where the moon will be at any specific time. But according to Zeno, if the moon has a specific position at a specific time, then while it occupies a specific location it cannot be moving. How can we explain this and still end up with a theoretical world with cause and effect and a one-to-one correspondence with reality?

All particles, all objects and all humans, use emission and absorption to interact with the world around them. These two separate stages — emission and absorption — depend upon each other. Stage one is departure and the motion of emission. Stage

two is arrival and the fill of absorption with a cessation of motion. Emission is the physical of the 1 using the 0 of a pathway for motion and absorption is the physical of the 1 entering a 0. Motion is emission used to leave a 0 and the cessation of motion is absorption which is the entering of a 0. The cessation of motion means motion has been completed for entering the parameters of the hole. From this phenomenon we can conclude that emission (departure) and absorption (arrival) are opposites which come from the binary 0 and 1 opposites that form the foundation of the universe.

Opposites define (corollary #9) each other and both stages of emission and absorption are necessary for our awareness of each opposite. The prior condition of absorption and arrival allows us to gain awareness of emission and emission allows us to gain awareness of absorption. It takes motion to know nonmotion and nonmotion to know motion as it takes *on* to know *off* and *off* to know *on*.

This dependency factor between emission and absorption must be a part of the pathways used by Zeno to unravel his paradoxes. There is no distinction of the pathway (0) unless we have physical (1) borders to define it. And we need borders to define the length of this pathway of motion and this is provided by defining where motion will start and stop. Every pathway includes a starting place before motion (emission) and a stopping place for absorption and the cessation of motion. Borders of motion are defined by borders of nonmotion and borders of nonmotion are defined by borders of motion.

By separating motion and nonmotion through emission (motion) and absorption (nonmotion), there is a straightforward way to solve these paradoxes. In all of Zeno's paradoxes he provides a path of motion for his moving objects. For the path to be defined, however, we must include the beginning (start) and end (stop) of the path. Before the *start* and at the *stop* there are nonmotion events to define motion. The stop and start give the borders to determine where motion will take place. It is important to note that in reality, motion is always separate from position. Posi-

tion occurs at the specific locations before the start of motion and at the stop of motion. Position and specific locations are the nonmotion and resting states used to define motion's specific pathway. Without knowing the pathway of motion, we cannot define and understand motion.

Nonmotion does not mean absolute motionlessness. In reality it appears impossible to reach a state of absolute motionlessness. What appears motionless does have motion at some microcosmic level. The term *nonmotion* names the arrival phase within the hole that is the goal. In this treatise, *nonmotion* is intended to show that the motion necessary for arrival within the boundaries of a particular hole has ceased. Nonmotion indicates there is no motion outside the identifiable borders of the hole used for absorption. An object's motion within a specific hole may continue, but the motion for arrival in this specific hole has ceased. The term *motion* means the motion necessary for an object's departure from a specific hole and arrival at a specific hole. Motion and nonmotion are relative terms determined by the objects entering and leaving specific holes. Motion is before entering and nonmotion is before leaving. This is a relationship between two holes and the motion between them. The beginning of motion starts from a previous stop of entering a hole and the end of motion stops the motion necessary for entering another hole.

The paradoxes provide a pathway for motion which, like all pathways, is defined by the borders of nonmotion — before the beginning and at the end of motion. The starting and finishing lines are the specific points necessary for emission to start from the past absorption (nonmotion before the start of motion) and for emission to end with absorption. As Zeno starts his runners and arrows along his initial pathway, he changes the pathway by placing new points and specific locations of departure and arrival that replace the initial pathway with an infinity of pathways.

In the first paradox, Zeno creates an infinite number of pathways with an infinite number of halfway points which each require another arrival and another start. The arrival is a stop that

depends on a start and conversely. *Arrival is absorption and signals the end of motion. Departure is emission and the beginning of motion starting from the end of motion.* With an infinite number of pathways defined by these new arrival points and points for departure, how can the runner pick only the first one from which to start? He cannot. The assumption in the beginning is that the runner has only one pathway for motion, but Zeno makes him run on an infinite number of pathways in defiance of reality. A real running path must always have a single beginning place (start) and a single ending place (finish). Relative to an observer the runner must either be a part of motion or a part of no motion. Zeno's halfway points of arrival require infinite processes of motion and nonmotion along a path designed for only motion. In reality the concept of arrival cannot be part of motion. It goes against pure reason and defies direct observation to have both arrival and departure occur simultaneously.

The crux of the problem is that when you start with one path of motion, it can only have one start and one stop and one departure and one arrival. The space in between departure and arrival can only be for the motion of emission. If you take one path and add more points of arrival, then you have changed one path into many separate paths. By definition, every path must include only one start and stop for emission to begin and end. Without these limiting borders, the rate and concept of motion cannot be precisely defined or even understood. Zeno takes the area between the beginning and end of motion, and then adds an infinite number of beginnings and endings. Motion is only a reach for an ending and these arrivals (endings) cannot take place for motion to continue. If arrival (specific points and locations) is placed on the emission phase, this brings motion to an end. To say the runner arrives at specific points while he continues to run contradicts both reason and observation. Arrival indicates the set location of nonmotion. To use arrival during motion is an erroneous use of language and an internal contradiction because you cannot arrive and depart at the same time. It is observable that opposites occur one after the other and not simultaneously.

The same internal contradiction has been incorporated in the race between Achilles and the tortoise. Zeno requires new arrival points for Achilles where the tortoise begins another departure. He creates his paradox with an infinite series of absorption (arrival) and emission (departure) points for both Achilles and the tortoise and therefore establishes an infinite series of separate paths of motion that originally started out as one path of motion. Achilles can never pass the tortoise because he is required by Zeno to take an infinite number of separate paths in which he always arrives when the turtle has already departed. Again, the concept of specific locations and points along the path of motion can never be a part of motion because it is part of nonmotion. *Motion* is one of a pair of opposites; it cannot occur simultaneously with the other one of the same pair of opposites: *nonmotion*. All opposites occur one after the other. The fill follows the empty or the empty follows the fill.

In paradox three, how can the arrow be in a specific location along the path of motion when it is in the emptying phase of emission? While in flight how can the arrow occupy a specific hole with specific borders at a specific location for its measurement and simultaneously leave its specific location? How can you come to one specific measurement (definition) for the position of an area if the area is continuously changing? To measure this specific location with a ruler, the geometry of the nonphysical between the observed arrow and whatever physical reference point is used for measuring must be stationary and unchanging. But motion requires the nonphysical between the observed and the observer to be in a constant state of change. The ruler becomes an unusable standard of measurement because a stationary frame of reference and a specific distance is unavailable.

To determine that the observed object has a fixed location relative to the observer, the space between them must be fixed. Both the observed and the observer may be moving relative to other objects, but in relationship to each other they cannot move. As an example, a passenger of an airplane in flight does not have motion with respect to the airplane, but both the airplane and its

passenger have motion with respect to the earth. The concept of *motion* and *nonmotion* is relative and depends on the relationship between the observer and the observed.

To explain the paradox of the arrow, the relationship between the arrow in flight and the human observer must be considered. The observer may insist on the arrow being in specific locations during its flight because he can mentally imagine it being at one place or another. The relevant question to ask is does the arrow really occupy specific places or does the observer's mind use specific locations for perceiving the arrow? Does the mental image of the arrow having fixed locations come from the observer's attempt to substitute that image in place of the arrow's actual motion?

I have concluded that the mind is also an absorber and that knowledge comes from a mental arrival which is the termination of motion. Light emission stimulates our senses with absorption in the brain. If knowledge is an arrival stage in the mind, and arrival is a suspension of motion, then how do we identify motion? How can we observe and understand motion if knowledge itself is absorption (the positional requirement of nonmotion)? Motion is the means to knowledge, but motion also ends with knowledge acquisition.

A solution can be found in comparing the brain to a motion picture camera. After exposing the film to moving objects and processing the negatives, the film consists of a series of nonmoving pictures that have specific locations. To create the perception of motion, the film is placed in a projector that will move (transport) the film past the projection lens. The camera is a recording device. The pictures recorded on motion picture film record the act of photon absorption. The photographic film records the light particles that have arrived and reached nonmotion through motion. Each light particle (1) strikes the film and is absorbed (recorded) at a specific place (0) on the film.

Like photographic films, the brain absorbs and records arrivals of information at specific locations. But if our brain only records still pictures, how can we perceive motion? Our sense of motion comes from a rapid series of still images (absorptions) taking

place one after the other, similar to the projector flashing separate still pictures at a regulated speed. The individual recordings of the mind are accomplished fast enough to also give us this mental sense of motion. Our perception of motion is created by a rapid series of separate arrival stages. The "projector" within our mind can play back on command our recorded memory of a series of still mental photographs to recreate the perception of motion.

The way the mind works helps explain our difficulty in unraveling Zeno's paradoxes. If the arrow's motion is visualized through a rapid series of specific locations (positions) in the mind, then it is easy to project this visualization upon the actual arrow or any object in motion. We are confusing the mind's perception of the arrow in flight with the arrow's actual flight. The observer observes a series of nonmotion events within the mind, but the arrow's flight is motion without nonmotion events. Our eyes and mind absorb the light reflected from the arrow in its motional state — as well as other objects in nonmotion states — but the arrow in flight is in a state of continuous motion. The light particles reflected from the arrow reach nonmotion for us and not nonmotion for the arrow. It is through recordings by the process of absorption that we attempt to measure and define the world around us. Absorption occurs whether objects are moving or not moving with respect to us.

When we envision the arrow at a fixed location while in motion it means this is where the arrow would have been if its motion had stopped. Instead of the arrow actually *being* at a fixed place, we have *assumed* that fixed place for the arrow. An example of this involves the use of a trainer's stopwatch to determine the position of his runner halfway through the race. Before starting, the runner has a specific location with respect to the track and the trainer. However, at the halfway point the runner in motion DOES NOT have an actual specific location with respect to the trainer or the track. This is because the relationship between the runner *in motion* and the trainer *not in motion* is in a continuous state of change. To take the runner's time at the halfway point, the trainer must assume the runner's position at the halfway

point. A return to an actual position — relative to the trainer — will not occur until the runner finishes his motion at the finish line. With a stopwatch the trainer records the runner's actual position at the start by the actual position of the watch at its start. He then records the runner's assumed position at the halfway point by stopping the watch. The runner's motion is surrounded by the actual position of the watch at its start and stop. At the halfway point the stopwatch hand has a fixed position, but not the runner in motion who has no fixed position. This is how the runner's rate of motion is measured.

This is another example of how opposites define each other. Let us time the runner at the beginning and end of his motion. We surround the motion of the runner with position (no motion at the start and stop) of the stopwatch to define his motion. We take the position (nonmotion) of the watch hand at the beginning and at the end of the runner's motion. The time lapse of motion between the two timing positions on the watch — start and stop — will give us the rate and speed of the runner's motion. We get rates of time for motion whether we *assume* a position for the object in motion or whether the object *actually* has position. In a like manner, to determine the time parameters for position instead of motion, we now surround position with motion. We use the end and the beginning of emission to give us a time frame for absorption and we use the end and beginning of absorption to give us a time frame for emission (motion). One opposite — motion or position — is used to define the other opposite. Wherever we experience a problem defining something, it is essential to study its opposite to create a definition or enhance its precision. See corollary #9.

The above illustration of emission and absorption defining each other explains why they do not occur simultaneously. I have aimed to show that they follow one another. In creating his paradoxes, Zeno placed the stage of absorption (specific points and locations) within the stage of motion (emission). His paradoxes require departure and arrival at the same time, and that objects in motion be placed at a specific location and leave that specific

location at the same time. Furthermore, they require that the distance between the observer and the observed object in motion be both changing and not changing at the same time. Zeno's venerable problems are paradoxical because once their solution is found, his paradoxes contradict both reason and observation. Position can be *assumed* for the observed object in motion, but that object cannot have an *actual* position relative to the observer. This does not deny the existence of the observed object, but it does deny that the observed object in motion has an unchanging dimensional relationship with the observer.

In reality, Zeno's runner moves from the start to the finish and Achilles moves past the tortoise because they never arrive at specific points during their motion. Zeno and his paradoxes notwithstanding, arrival can never occur during motion and therefore arrival can never be a part of motion. The position of arrival occurs at the end of motion.

If knowledge is the positional notations of absorption and if our awareness of motion is an accelerated series of mental photographs that are separate pictures of nonmotion, we can reach the conclusion that motion cannot be a direct experience for anyone. This conclusion is based on observational evidence of how nature works. This is another example that motion is a means to reach observational processes and is not a direct part of observation. Motion is an indirect and prior process that must cease before mental pictures are possible. This will be an important conclusion from the discussion of quantum physics in the following chapter.

I am not suggesting that because motion and position cannot occur simultaneously that we must wait for motion to stop before it can be measured. To be sure, if we waited for physical motion to stop, scientists might as well close their labs and go home. It is important to *assume* a position for an object in motion even though in actuality it has no position. This assumption allows assumed positional predictions for the moon and planets of the solar system. By assuming planetary positions we need not create actual planetary positions during their motion. It is useful to say

where they will be at a specific time as long as we understand this is where they would have been if they had stopped their motion.

Some may say, "So what difference does it make whether position is actual or assumed?" It should be emphasized that the reality crisis in physics is tied to this fundamental question.

The mathematics of quantum physics concludes that in the microcosm, position and momentum of subatomic particles are mutually exclusive. Quantum mathematics indicates that when we measure the position of a particle we cannot measure its momentum and when we can measure momentum we cannot measure position. This was noticed in the matrices of Heisenberg's quantum equations. It denies the existence of objects with both specific locations and paths of motion at the same time. However, physicists still insist that position and motion (momentum) are simultaneous events. The present conclusion by some is that reality is different in the microcosm than the macrocosm. However, what if the quantum equations are dealing with actual positional processes and are showing that actual position is separate from motion? What if the mathematics indicates that position and motion are not simultaneous? Through these equations is nature telling us that actual position does not occur during motion? What if in the macrocosm of "up here" we also cannot have knowledge of actual position and momentum simultaneously as the equations state for "down there" in the microcosm? Could both the microcosm and the macrocosm be following the *same* rules? Is the obvious alluding us again?

The importance of solving Zeno's paradoxes is very much involved in the way we interpret the world. The paradoxes invented by Zeno attempt to place the points and specific locations of no motion on the path of the object in motion. But motion cannot include arrival locations along its path; arrival can only become part of the end of motion. To say an object has arrived while still in motion is a false description of motion. To have any meaning, each pathway must have a beginning and an end with motion in between. It goes against reason to inflict an

end (arrival at specific locations) to motion while the object continues to move.

Zeno was correct to insist that specific locations for an object and motion for an object cannot occur together. To place actual position on the observed with respect to the observer you must have nonchanging spatial (0) boundaries between them. The solution to Zeno's paradoxes can be found in this conclusion: *Actual position and motion (momentum) with respect to observed and observer cannot occur simultaneously.*

A simpler way to state this may be that emission and absorption are not simultaneous events. Each requires the prior existence of the other before it can occur. Absorption is the starting point for emission and the end of emission is the starting point for absorption. Emission is motion that is part of momentum and absorption is the end of motion and a reaching of position.

In creating the paradox of the arrow, Zeno established only the arrow's path of motion by excluding reference to *before* and *after* the arrow's motion. Going beyond Zeno we start by identifying the arrow at the absorption stage within the drawn bow. This is followed by the arrow's departure (emission and motion) and then on to arrival and absorption at the target. When Zeno places points (specific locations) on the path of motion, he places the target of arrival *on* the path of motion when instead it follows *after* motion. The bow is also a target for the motion of the arrow to arrive at the drawn position. Position of the arrow in the bow is required for motion to start and position at the target is required for motion to stop.

In the beginning if we separate both the nonmotion (no motion) before the *start* and the nonmotion of the *stop* — with motion in between — then we can define and understand the true pathway for motion. When we break with Zeno and finally stop changing the parameters of motion with new stops and starts, his classical "paradoxes" are no longer paradoxical.

CHAPTER 6

SCHRÖDINGER WAVE EQUATION AND SEMICONDUCTORS

THE SUBJECT of "wave equations" may have an alarming ring of difficulty; however, by learning how to interpret the meaning of a wave, the difficulty is diminished. After reading Chapter Nine on waves, you may want to return to this chapter again. For an introduction to the subject of wave phenomena, I recommend three books that explain the problem of wave interpretation: *Quantum Reality*[1] by Nick Herbert, *In Search of Schrödinger's Cat*[2] by John Gribbin and *The Dancing Wu Li Masters*[3] by Gary Zukov. Written for non-physicists, these books reveal the seemingly impossible task of contemporary physics to

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[1] Herbert, Nick, 1987. *Quantum Reality,* New York: Double Day and Co.

[2] Gribbin, John, 1984. *In Search of Schrödinger's Cat.* New York: Bantam.

[3] Zukov, Gary, 1979. *The Dancing Wu Li Masters: An Overview of the New Physics.* New York: Morrow.

explain a wave's relationship with particles. Learning the difficulties with current interpretations of these relationships may be helpful in understanding my interpretation. I will use these interpretations as a guide to solving these wave problems.

The Viennese physicist Erwin Schrödinger made important contributions to quantum mechanics with the development of his mathematical wave equations. These equations have been essential in the development of our most advanced technology. This discussion will be directed to the difficulties of current attempts to explain these wave equations. We will begin by summarizing how physicists describe the *wave function* of Schrödinger's equations. The wave function somehow incorporates a particle within the propagation of the wave. The wave occurs in isolation between two regions: the region of preparation (where the wave begins) and the region of measurement (where the wave ends). Information concerning the apparatus involved with the region of preparation and measurement is entered into the equation. As the wave begins, there is a continuing mathematical development of the wave. This development shows the constant changes of the expanding wave which includes its proliferation and a continuous unfolding of the multiple possibilities of the particle's location in the wave. This continuing and changing mathematical expansion for the wave occurs only between the region of preparation and measurement. If the amplitude of the wave function is squared, it reveals a *probability function.* The probability function is a calculation that predicts the probabilities of the various locations a particle will reveal itself when located at the region of measurement. The probability function is a prediction of how likely it is for the many positional possibilities of the particle to occur. When measured, any of the possibilities for position can occur, but some have greater probability than others. The mathematics only describes the probabilities of the possibilities of the particle's position and this determination are only at the region of measurement. The wave function data are not specific about a precise location for the particle during its involvement with the wave. The

wave function only gives the probabilities of a multitude of possible positions prior to the decision to measure.

Physicists are commonly perplexed by the wave function. Why does the wave give so many possible locations for the particle? It is believed that in the macrocosm there is only one identification of position during momentum (motion). Why all the possibilities in the microcosm? At the macro level, at any given moment, there is only one place for objects to exist. Whether we look or not, we have confidence of determining a location for an object during its motion. But in the microcosm of the wave function, there are myriad possibilities of position. In the domain of quantum mechanics, we cannot be sure of anything until we look by measuring. A basic problem for physicists is that at the macrocosmic level they are assured of determining the position of an object during motion, while at the subatomic microcosmic level the equations (wave function) will not allow the determination of a particle's position during its motional propagation within the wave. The question is, why will the wave equation not permit an accurate determination of a particle's position at any moment during the wave's proliferation? This apparent contradiction between the microcosm and macrocosm has created a crisis for some in the scientific community. Some physicists have concluded that cause and effect is inoperable in the subatomic realm and that the macrocosm and microcosm are governed by different rules.

Because of the particle's multiple possibilities of position at any given moment, some have concluded these possibilities are only a *potential* for a particle to exist in a wave. It is said the particle is a potential entity at every place indicated by the possibilities of position. In some way, all of the particle's possibilities and none of the particle's possibilities occur at the same time. Another interpretation states the particle is part of all of the possibilities of position and only one possibility can be actuated by its measurement (observation). Some say that it is the observer and his observation that makes possible a particle's existence. Somehow upon human observation (measurement), the particle mysteriously presents itself and its previous multi-dimensional presence within the

wave becomes a normal three-dimensional existence. Some have generalized this to include the entire universe. This view states that universal existence can occur only when the observer interacts with the observed. Until we look (observe), all of the possibilities of position are held in suspension. The conclusion is that existence is actuated only by our observation; that objects are at an infinity of suspended states until we observe. Only when we look will objects materialize at one particular state. A full circle is reached by a return to the posture that we are at the center of and the cause of universal existence.

Physicists only seem capable of providing an existence for the particle before the beginning of the wave at the region of preparation and at the end of the wave at the region of measurement (observation). During the wave, physicists can say nothing about physical entities except that they are in a state of limbo being everywhere and nowhere: a condition between existence and nonexistence.

The equations of the wave function reveal the wave as an expanding process which occurs over a large area, while a particle is a local entity that occurs at a small area. The wave somehow involves the wholeness of nonlocal conditions. The question is, how can the *local* and separate nature of the particle be part of a *nonlocal* and much larger wave? Because of these local and nonlocal differences, a wave shows itself only as a wave and a particle shows itself only as a particle. For the physicist there is either a wave or a particle, one or the other but never both at the same time. The dilemma in particle physics is to reconcile how the waves and particles are related to each other. During the wave, we cannot define the wave's relationship to the particle and when the particle is defined it is not part of a wave. During motion there is a wave and at arrival with the measuring device there is a particle.

The potentiality of a particle being many places within the wave changes during measurement to its measured appearance at one place. This measured appearance is called the *collapse* of the wave. When measured, the particle shows itself and at the same

time the wave ends in collapse. The problem this raised was: what is happening to the particle between the region of preparation and its appearance at the region of measurement? How do particles and waves exist as a part of each other?

One can imagine the consternation of physicists in contemplating a subatomic world without apparent cause and effect. It was a major departure from the classical perception of reality. These quantum mathematical equations cannot be cast aside, because their solutions are correct. An outgrowth of quantum mechanical applications has given us much of our modern technology. This includes transistors, superconductors, nuclear power, computers and laser technology. While quantum applications to certain technologies have been spectacular, quantum interpretations and quantum reality remain an enigma.

Various interpretations of Schrödinger's equations were made by various physicists after Schrödinger had published. Schrödinger was unreservedly disgusted with "quantum jumping," the "wave collapse," and other departures from classical reality. To show the absurdity of these explanations or lack of explanations, Schrödinger developed a now famous thought experiment. A cat is placed in a box and a device inside the box is designed for the random decay of an atomic particle. The release of a particle will activate a poison gas that will kill the cat. The odds are even that the poison gas will or will not be released. The cat has a fifty-fifty probability of survival. The experiment is activated without human observation and the question is raised, if humans do not look, will the cat die or live? Typical quantum interpretations claim that until the observer looks, the cat is between extreme possibilities. The cat is neither dead nor alive until humans actuate the alternatives by looking. All possible states (alive or dead) exist until activated by the process of looking (measurement). Prior to human observation, there is only a potential for a subatomic occurrence. All possibilities and no possibilities exist until we look, that is, observe and measure subatomic phenomena. This sounds preposterous and the aim here is to reach interpretations that are consistent with observation and reason.

Schrödinger's thought experiment links the microcosm with the macrocosm with a radiating atomic particle. The absorption of photons (light particles) from the sun links the necessary intertwining between humans and microcosmic particles. With his thought experiment, Schrödinger is suggesting that there can be no real separation between humans and the microcosm. By applying rational analysis it becomes obvious that there is a problem with these typical interpretations of quantum physics. How can these irrational interpretations be replaced with rational explanations that acknowledge cause and effect? Schrödinger's cat will be either dead or alive without our looking.

There have long been attempts to show the necessity of a human presence to activate existence with this proverbial challenge: if a tree falls in a forest and there are no humans present, will there be a sound? The implication is that natural phenomena are dependent upon human presence. However, the absence of human observation and interpretation of these oscillating waves of air as sound does not deny the existence of these waves. What about other absorbers of this energy — plants, rocks, soil and trees — that are not human? Energy, nonetheless, is still absorbed and transferred through all objects. Humans responding to sound waves — one form of energy absorption — have interpreted and labeled this class of absorption as *sound.*

Do we really understand the complexity, methods and response to the absorbing techniques of nonhuman structures? Human minds absorb energy in many different ways which include observation and we use language to describe it. But there is a universe of other structures that absorb and also "react" to their absorption. Do our techniques and reactions to energy assimilations make us the centerpiece of the universe? Is human absorption the "supreme" absorption in nature? Are we qualitatively superior to the energy ingestion dynamics of the atomic and subatomic realm? All objects absorb and emit waves of energy. Humans have their processes of absorption and emission and other structures have theirs. I believe the atom has more versatile emission and absorption processes than do humans. The atom's

time frame for development is certainly longer than our human time frame of development with its recent emergence.

In our attempt to understand the nature of position and motion, what have we missed that gives us conclusions defying observation and reason? Should we accept this departure from causality? Have we forsaken rational explanations of the atomic world and then attempted to extend this irrationality into the macrocosmic world beyond the atom? Some insist that it is a waste of time to change this nonsense into sense. Must we continue to live with these illogical explanations? It is time to admit our ignorance and continue the search for a rational foundation of atomic structure.

The basic problem is this: why does the nature of the wave function disallow access to its inner workings? How can we come to positional knowledge of an object's motion in the macrocosm and yet in the microcosm this knowledge is denied? Why do the wave equations deliver only the possibilities of a particle's location instead of its actualities of location?

Zeno's paradoxes were solved by disclosing the fallacy of reaching positional points of set locations while motion continues. The difficulty in interpreting Schrödinger's wave equation is directly related to Zeno's paradoxical misinterpretation of motion. Quantum mechanics is a study of microcosmic motion. The physicist's dilemma in explaining Schrödinger's wave equation is tied to his concept of motion and its relationship to position. The inability to simply explain Zeno's paradoxes is for the same reason. It is time to see a different relationship between an object's motion and an object's position.

Since Newton, the rate of motion has been determined by placing specific locations of position on motion during motion. Position is essential for defining motion and this creates, however, a mindset that position and motion are simultaneous. Physicists to my knowledge have never questioned the idea that motion (momentum) and position are synchronous events. Has it never occurred to them to doubt the possibility that position and motion are not synchronous — simultaneous — events?

The resolution to Zeno's paradoxes is to remove fixed locations of position on the path of motion by concluding that arrival (position) cannot be part of the journey (motion). This opposes current concepts of motion; however, this does not oppose the necessity of imposing an assumed position on motion for reaching a definition for motion. Instead, solutions for Zeno's paradoxes forbid the notion that actual position — a fixed location — occurs during the motion of the observed relative to the observer. For an understanding of motion during motion, there is the necessary *assumption* of position, that is, this is where the object would have been if it did have an actual position.

Schrödinger's wave equation involves the motion of a particle. The wave involves motion. To remove the belief that we should be able to impose fixed positions on the particle during its motion is to remove the difficulty in interpreting the equation. To separate position from motion — one after the other — is paramount to our understanding because the wave is solely and exclusively involved with motion. In actuality, motion and position are two separate stages where the stage of motion (emission) is used to reach the stage of position (absorption).

If emission and absorption represent the basis of how objects interact, then let us use this duality to interpret the wave and the particle and the "jumping" that cause a wave to "collapse" during interaction with a measuring device.

If emission is the stage of motion (momentum) for a particle, then absorption represents this separate stage of position. The key to understanding why the wave equation does not give us actualities for position comes with the realization that a wave involves the emission of a particle and not its absorption (position).

To "regain" cause and effect within the wave function, let us consider the possibility that a wave is associated only with the emission stage of a particle. The separate wave stage is associated only with a particle's motion used to reach the separate stage of position. The collapse and cessation of a wave is a collapse and cessation of the particle's motion. A wave is the departure stage of the particle leaving a hole, while the arrival stage ends the wave

(motion) when the particle enters the hole of the measuring device. Is the change from a wave to a particle — collapse of wave — at the measuring device, merely a particle's change from the separate stages of emission (wave) to absorption (measuring)?

For reaching logical conclusions, it must be clear that all of our defining processes are processes of measurement and that measurements are part of the stage of absorption. Measuring devices are human extensions of observation for reaching mental absorption.

The wave is the emission stage reaching for the next stage of absorption (position). The absorption stage is the measuring stage that collapses the wave (emission stage). Is the beginning (start) of the wave at the region of preparation necessary to reach an end (stop) of the wave at the region of measurement? Is the region of preparation a prior positional requirement for the particle's start of motion (emission and wave)? Is this start necessary to reach the stop of absorption (measuring)? Is the region of preparation the same as the arrow within the drawn bow, and is the particle's arrival at the region of measurement the same as the arrow's arrival at the target? Is the arrow's motion an isolation of motion (wave) between the arrow's nonmotion at the bow and the target? Is this the same as the particle's motion in isolation between its nonmotion at the region of preparation and the region of measurement? The answer is yes to these questions.

A conclusion is that the motion of all objects is a stage of isolation between the stages of nonmotion. The wave function is indicating this through the wave's isolation between the region of preparation and the region of measurement. The wave of emission is always isolated (separated) from absorption. The human isolation from motion is used to join together the non-isolation stage of mental absorption. Opposites are again showing themselves where the opposite *apart* phase of motion is necessary for the *together* phase of absorption (nonmotion). The nonrecording event of motion is necessary for the recording event of nonmotion. The act of not measuring — a part of emission — is a required condition prior to measuring which is a part of absorp-

tion. An *off* (emission and wave) is necessary to have an *on* (absorption and wave collapse). Wanting to find position within the wave is like wanting *off* and *on* at the same time.

The wave stage (motion) by itself can never become a part of awareness and knowledge. Motion can never be a direct experience of itself; motion is used to reach a direct experience. The inability to look at a wave has always been a requisite to looking. The wave is a required period of non-measuring that must occur before measuring.

The wave of emission can never be a direct part of knowledge; rather, the wave of emission is used to reach knowledge. Ignorance is part of the wave that collapses with knowledge. For the human mind, the collapse of the wave is the collapse of ignorance. This shows the necessity and value of ignorance. Without ignorance and the empty (0), a wave would be unable to reach the fill (recording) necessary for knowledge.

What happens with the attempt to change the wave's possibilities of position into actualities of position as the wave continues? This is an attempt to interject the stage of absorption into the stage of emission. It is another fruitless effort to impose fixed locations on motion while motion continues. The paradox is self-imposed by the presumed — obvious but erroneous assumption — that actual position and motion are simultaneous. The different events of position and motion are understood by the recognition of the hole (0). Emission is the motion of an object leaving a hole and absorption is the position of an object reached by entering a hole.

The wave function of Schrödinger's equations describes what has always been a part of nature. Physicists want definitions during the wave where the necessary non-defining stage is occurring. To want fixed locations in the wave is an attempt to want to make ignorance and knowledge, arrival and departure, on and off, simultaneous events. This is like eating our cake without the prior necessity of bringing it to us. The function of the wave is to bring the particle to us.

The wave can never be a direct part of our experience. The wave is an indirect process — as is all motion — used to get to a direct process.

The illogical interpretation that a particle exists everywhere and nowhere during the wave's propagation can now be reinterpreted. The wave does not deny the particle's existence, but it *does deny a place* for the particle to exist in. There is no specific fixed location for the particle during the wave because the particle is yet to have a relationship with an absorber. The concept of *where* must involve both the observed and the observer. The observer is the absorber and the observed is that which is absorbed. Mental absorption for humans is an arrival at definitions which are positional processes. The wave involves the particle that does not yet have access to an absorber. With arrival the particle now becomes the observed because it has been absorbed by an observer. The act of absorption is what defines an observer. An observer is an absorber.

Humans, instead of providing an existence for objects by looking, are providing a place for objects to exist in. Everything in existence does not always have a specific fixed place (0) to reside. The "purpose" of motion is to reach an arrival process for what does exist. During the wave we will never know *where* the object is relative to ourselves or anything else. By looking (observation through mental measurement) we give the particle a place to reside.

The interpretation of the wave function that particles only have a potential to exist during a wave can now be discarded. The potential of particles in motion (wave) is a potential for particles to reach the absorption stage. It is a particle's potential for existence within a specific hole (place) provided by the absorber. The *potential* is the possibility of *where* the particle may exist instead of its existence. An object in isolation (in motion) still has the existence of all of its physical and nonphysical attributes. The only thing it does not yet possess is an absorber. The object in motional isolation does not yet have a relationship for defining its 0 and 1 characteristics. When humans mentally absorb they gain

information. Once absorbed, information has a place to exist and is stored in the mind for immediate and future use.

The wave function gives a continually changing description of all the possibilities of its position when the observed (particle) interacts with an observer (measuring device). Understanding occurs by realizing that possibilities are always part of motion (wave). *Possibilities* are possibilities of position that cannot and will not occur during the wave (motion). This is the way nature works. The terms *possibility* and *actuality* are opposites that are necessary to derive each other. Actualities are part of arrival (measurements) and a defining process. Possibilities are part of the possible interrelationships of the 1 and the 0. The possible is the 1 of the object having access to the 0 of the absorber. The possible moves to the actual when the 1 of the object enters the 0 of the absorber. The 0 of the possibility is removed by the 1 of actuality.

Possibilities within the wave (motion) are the number of possible holes that may be available within the space (0) the particle has access to. This space (0), used for the particle's propagation, provides the space for the particle's eventual fill by the 0 of an absorber. The nothing of space provides an infinite number of possible pathways and holes for matter to organize.

Zeno showed the infinite possibilities of holes for arrival with the halfway points for the runner. This infinity of possibilities provides answers for why the wave function cannot predict with accuracy at which hole the particle will arrive. A question to consider is, where will the particle be for absorption when space (0) can access an infinity of possible places for absorption? How can humans "predict" future possibilities with accuracy when those possibilities are infinite? This describes the concept of chance. Where there is *chance* there are infinite possibilities for absorption of objects in motion. There is no possibility of predestination if destinations (0) are infinite. How can position be foreordained if all the possibilities cannot be determined? Where there is infinity, "all" does not apply. Where we arrive always involves an element of chance. The *where* in arrival can never be predicted with absolute certainty. For this reason all action is a part of chance. The

wave function at best can only show probabilities of the possibilities. Probabilities indicate a greater likelihood for the future events of arrival. Humans also use probabilities for reaching their positional defining processes necessary for survival. Understanding the probabilities reduces the *chances* of failure. It is the infinity of the possibilities of arrival that "requires" the wave to give us only probabilities.

Instead of the particle being involved with all the possibilities, the particle within the wave is not yet part of any possibilities. Possibilities are those of position not possible in the wave. The particle is involved with motion (wave) and not position. The term *possibilities* is a reference to what may happen in the future when the particle reaches its position (absorption). To require that position be a part of the wave is impossible. It is an attempt to inject nonmotion on the object while it still moves. The wave function is pure motion and to inject arrival upon it eliminates the wave.

There is more to nature than waves (motion). The physicist's focus on motion is like his monocular focus on the *physical*. Newtonian and quantum mechanics are the study of motion. The mistake is in concentrating only on motion when the why of motion is position (absorption). However, it is easy to focus on motion when position and motion are conceived to be simultaneous. Comprehension is accomplished when any subject's opposite is included in the analysis. To perceive motion and position as opposites and that opposites occur one after the other, should be convincing evidence of their inability to coexist simultaneously.

If the *why* (what for) of motion is introduced, it implies the question of whether or not teleology exists. The implication that motion may have a reason to occur, suggests there is more to nature than motion. What is at the end of motion? The *why* of motion is in reaching and entering the positional hole of the absorber.

Contemporary physics does not show the interrelationship between the wave as a "large" expanding nonlocal concept and the particle as a "small" finite local concept. The salient question

is, how can a wave be part of a particle and a particle part of a wave? It appears that a wave is different from a particle. But what if waves and particles are dependent upon each other? Instead of trying to view them as having a separate existence, consider that one is impossible without the other. This is a part of corollary #1 stating the necessary interdependency of the binary 0 and 1. Is the wave a part of the nonphysical (0) that the particle (1) is dependent upon? Should we incorporate the nonphysical (0) and the physical (1) in explaining the nature of quantum waves as well as all wave phenomena?

A football game will be used here to describe this relationship between a wave and the objects involved with a wave. Football stadiums are constructed to organize *fields* of play for the games. What are fields? In football, fields are used to organize space (holes) for the emission and absorption of actions used by the players. All physical (1) action requires the use of fields (0). The motion (emission) phases of the ball and players are wave phenomena. The field has a prime hole which is the goal of the game. The player's wave (emission) is to reach the goal. As in all natural phenomena, the "goal" is to enter the hole. As in particle physics, the "goal" of the particle's motion is to reach a hole which is provided by the measuring device. Upon entering the hole, the wave collapses (ceases) and positional absorption takes place. As the players move toward the goal, the wave is expanding and proliferating. This can be envisioned if we consider the continuous geometrical changes that occur to the field (0) as the wave (1 of players and 0 of field) advances. There can be no change to the field (0) if the players (1) are not involved. Both the 0 and 1 are necessary for all universal action. As the player's (1) motion advances, the size of the wave and its associated field (0) becomes larger. The amount and size of the field (0) being used expands. To understand a wave and its relationship to the physical of all objects, it is necessary to include the expanding and proliferating changes of the 0's geometry as the physical part of the players manipulate the field with emission. The nonlocal and larger concept of the wave is the field of organized space that is

an integral part of the wave. As the players use more of the field, the field continues to expand. The other part of the wave includes the finite local concepts of the players. The wave is always a synthesis of the physical (players) and nonphysical (field). The *large* part of the wave is the field that the small part of the wave — finite physical — is using. The larger size of a wave exists because it includes the particle's use and involvement with its field (0).

The failure to identify the wave, and its essential field of nothing, is the same failure to identify the essential field (empty column) of the counting board. In a like manner, when watching a football game the viewers concentrate on the ball and the players. They are not directly aware of the spatial (0) relationships to the physical (1) that make the game possible. This is analogous to viewing a particle. The focus is on the physical (1) and we disregard and are insensitive to the 0 field that the physical uses for its occupation and propagation. A wave cannot exist without a *physical (1) and a field (0).* The field is the medium of motion for the physical. The wave has the binary phenomena of both the 0 and 1. The local physical is always a partner of the nonlocal nonphysical. The opposite terms local and nonlocal are showing their interdependent binary foundation.

The wave equations of quantum mechanics are more involved with the fields of nonmatter. Newtonian mechanics is more directly involved with matter. The wave function is unique in that it is limited to the emission stage of motion. The wave function is involved with the nature of the expanding and changing field of nothing. The wave function's description of motion necessarily involves the limits of motion. It is the limits of a concept that give us the contrasts (opposites) necessary to understand the concept. The limiting factor for the wave is position. To understand a wave requires the opposite concept of the object's position at the start and at the end of motion (wave). To understand the idea of motion, it is necessary to contrast motion with the idea of nonmotion. The contrasts provided by our binary universe give us awareness.

The wave function elegantly describes the microcosm with the continuous changing and expanding geometry of nothing (field). The geometry of nothing changes as the motion of particles changes. The physical of the particle is necessary for the changing dimensions of the field (0). The physical during motion creates changes in the nonphysical's geometry. When the 1 changes it changes the 0. These continuous changes create the inability to define the particle. The collapse of the wave collapses these changes, allowing a stationary field (0) for absorption and knowledge of the object.

We can now revisit the cat in Schrödinger's thought experiment. Cause and effect are necessary to explain the problem. The use of cause and effect implies two stages: one for the *cause* and the other for the *effect*. Does this have any relationship with the two stages of emission and absorption? I propose that emission and absorption and the forces of attraction and repulsion are the foundation of cause and effect. The forces of attraction and repulsion are a part of the dual stages of emission and absorption. Cause and effect involve the 1 and 0 and their attraction to each other. It can be stated that the cause of all motion is for the effect of reaching position. The force of repulsion guides this attraction during emission to absorption. Absorption is provided by the 0 of the absorber and the 1 of the absorbed.

Quantum interpretations indicate that until we look Schrödinger's cat cannot be either dead or alive. The cat is held in suspension between both life and death. By physicists arriving at this interpretation of the wave function it paradoxically makes humans the only absorbers (observers) in a universe that absorbs. Our first step is to understand that the wave function deals only with the stage of emission. The next stage is absorption: measuring and observation. To say that the cat is neither dead nor alive until we look is to state that only humans can culminate and end (collapse) the wave through absorption. This is not the case because the motion of the wave of released poison can be terminated (collapsed) by the stage of absorption provided by the cat. To state that the cat is neither dead nor alive until human observa-

tion (absorption) is to inadvertently set ourselves up as the only absorbers in the universe. However, the universe is a composite of structures that are both absorbers and emitters. The wave equation is involved with emission and this is only one part of nature's two-part binary system. The cat is always capable of *collapsing* by absorbing the wave of poison gas which is triggered by the released wave of an atomic particle. The collapse of the wave of atomic radiation is when it is absorbed by the poison container. This in turn produces a wave of poison gas which collapses with the cat's absorption of the poison. On the other hand, if the cat does not die there has been no wave for the cat to collapse (absorption). There is no wave unless atomic radiation is released.

When humans finally look (observe) to determine the condition of the cat, they also collapse a wave. An emission of a wave of photons is reflected from the cat to reach absorption (vision) by humans who identify whether the cat is dead or alive. Information of a dead cat is reached by our collapse (absorption) of a wave of photons showing the cat's previous collapse (absorption) from the poison wave. Information of a live cat is also reached by a photon wave collapse showing us there was no poison wave released.

Through a rational analysis of Schrödinger's thought experiment, our perception of cause and effect is returned to the microcosm. The attempted removal of cause and effect from the microcosm while retaining it in the macrocosm is not possible. Cause and effect are irrevocably connected for all nature. The cat "problem" and its solution reinforce the idea that without an understanding of cause and effect, ignorance (0) emerges. With the recognition of the 0 of ignorance comes the opportunity of replacing it with the 1 of knowledge. To believe that cause and effect are unavailable in any area of nature decreases our survival capabilities. If the ignorance of a hole exists there will always exist the possibility of combinations of the 1 to fill the hole of ignorance. The impossible exists only if we cannot create both the hole and the 1 to fill it. The building blocks (0 and 1) are always available. When illogical interpretations are used, it usually means

that ignorance (0) is faced by more ignorance (0). This is the non-progress of repulsion (0 to 0). Forward motion toward solutions is prevented by only relying upon past knowledge. This is a 1 to 1 of repulsion where only past knowledge (1) confronts past knowledge (1). There is no arrival of new knowledge. This is why new ignorance is essential because it supplies a new 0 for the new 1 of knowledge to fill. It is the realization of ignorance and not knowing, which makes available the 0 that stimulates us to fill it with knowledge. When we could not explain the paradoxes of subatomic domain, we created pseudo-knowledge by concluding there was no cause and effect. This is having the 0 of ignorance and deciding it was meant to be a permanent feature of the mind. However, the 0 of ignorance is designed for the fill of knowledge. Our present evolutionary status indicates there can be no exceptions. Our survival is dependent on these continuing mental oscillations between ignorance and knowledge.

A rational interpretation of the wave function simplifies its understanding. *A wave is the motion of matter using the field of nothing for its propagation.* The wave function shows the large and nonlocal expanding nature of the field's (0) geometry as it relates to and is used by the small and local matter. The wave is used to approach the possibilities of ending the wave by matter entering a specific hole and establishing position. The collapse of a wave is a collapse of the motion required to enter the hole of absorption. As matter reaches position it no longer requires the use of the field of nothing for its propagation. The expansion and proliferation of the geometry of the field of nothing is discontinued when matter arrives. Matter no longer provides the motion of its physical borders to enable the field's continual changing non-physical borders. The field (0) becomes stationary upon the arrival of matter (1) because matter has no motion outside the parameters of the hole.

SEMICONDUCTORS

In solids such as metals, electrons are bound tightly to the nucleus within valence bands. There are also bands that allow

electrons to wander around from atom to atom and these are known as conduction bands.

In a semiconductor, the valence bands are filled with electrons and there is a narrow gap between the valence bands and the conduction bands. This allows electrons within the valence bands to move into the conduction bands when they gain sufficient energy. Current views in physics correctly state that the resulting absence of the negatively charged electron within valence bands leaves behind an empty hole that acts like a positive (in reality "negative") charge. This confirms the correctness of Franklin's reasoning with his excess (1) and deficit (0) and relates the excess addition to a positive (+) charge and a subtraction deficit to a negative (-) charge. The electron's jump into the conduction band creates an excess within the conduction band and a deficit within the valence band.

Semiconductors occur in nature. We have created synthetic semiconductors, some with an excess of holes (0) and some with an excess of electrons (1). The combinations of these positive (1) and negative (0) semiconductors form the basis of digital computers. Beyond computers, these combinations of 1s and 0s are necessary for all working systems.

It is important to note that a hole (deficit of electrons) is said to have a charge. Are we one step away from making the hole "responsible" for all negative (today called positive) charges? Where the hole is filled, this creates the positive (today called negative) charge. In reality emission creates the empty negative (-) and absorption creates the filled positive (+).

Resistance to this new view may result from its simplicity, and yet this is a large part of its corroboration. A goal of understanding nature should be to minimize the amount of information necessary to explain natural phenomena. To recognize that the hole has a charge (-) is the key to understanding the wonder of the oscillating (emission and absorption) universe. This recognition provides an identity for the partner (0) of the physical (1).

CHAPTER 7

MATTER (1) AND ANTI-MATTER (0)

PAUL DIRAC BECAME an important physicist during the early development of Quantum Mechanics. Building on Einstein's work in relativity, Dirac created a relativistic version of quantum mechanics. He noticed that the "mc" of the equation, $E=mc^2$, has both positive and negative roots. The inclination in physics was to use only the positive root, but Dirac focused on the negative. He recognized he was dealing with not only positive energy but with negative energy as well. We observe positive energy all around us, but what does negative energy mean?

Dirac conceived that the real world we see is a world of positive energy. He postulated that empty space is a sea of negative energy particles. It was already known that if you give an electron positive energy, it will move up the energy ladder. This is an addition process. To Dirac it seemed reasonable that if an electron in a sea of negative energy is given some positive energy it could move out of the negative energy sea of empty space to become an ordinary electron. With this exit, he reasoned, a hole is left behind

in the sea of negative energy. This hole acts like a positively (in reality negatively) charged particle. As in the illustration of the semiconductor again, we give the hole (0) a charge.

Dirac explained that any particle can be produced by this positive energy input as long as it also produces the opposite charge. The positive energy input creates a positive energy particle (such as an electron) with a negative charge and simultaneously creates a negative energy particle with a positive charge. This is consistent with the law of conservation of charge. If Franklin had guessed right, positive and negative energy would match positive and negative charges. Instead, we require a particle to have simultaneously negative and positive attributes: negative energy along with a positive charge and positive energy along with a negative charge. We have created an inconsistency that leads to a misunderstanding of nature's consistency.

The negative energy particle is thought to be in an anti-matter state and is called an anti-particle. Every particle in a positive energy state has its opposite particle in a negative energy state known as anti-matter. These have been well demonstrated by cloud-chamber technology.

The problem continuing to perplex the physicist is, where is the anti-matter? Outside of rare "glimpses" of anti-matter in quantum experiments, it seems to be missing and not a recognizable part of our sensory mechanisms. However, I intend to reveal anti-matter as a part of the observable world. We have missed observing it because we have missed understanding the role that the geometrical hole plays as a dependent part of the physical.

What is the meaning of the prefix "anti" in anti-matter? "Anti" is a prefix of opposition to one thing or another. The dictionary records anti as, "of the same kind but situated opposite of the attached base word." The prefix *anti* means the opposite. Anti-matter, then, is the opposite of matter. Contemporary science does not have an adequate explanation for anti-matter. Physicists generally believe that both matter and its opposite anti-matter have the same mass and the most common explanation of the difference is that they are mirror images of each other. Notice how

Dirac's description of antimatter as a hole in the fabric of nothing is in sharp contrast to the common view stated above that the mass of both matter and anti-matter is the same.

What is the greatest opposite that can be created for matter and its physical properties? The greatest opposite of matter is non-matter. The anti of something is nothing. If the nonmatter of nothing is anti-matter, then we can conclude that an anti-matter particle is in the nonmatter state of being empty which is a negative energy state. Also, a positive energy particle is in a matter state of the fill.

To subtract energy is an emission of matter which brings an object — the object that emits — to the nonmatter (anti-matter) state. This is the negative energy state.

To add energy is an absorption of matter which brings an object — the object that absorbs — to a matter state. This is the positive energy state.

Negative energy is energy taken away through emission and this creates the nonmatter and empty state of anti-matter. The term anti-matter can now be understood to be the nothing of the nonmatter empty state for any object.

Because science has concluded that both particles and anti-particles have the same mass this presents an internal contradiction. If anti-matter means empty (nonmatter) particles, then how can particles and anti-particles have the same mass? Researchers now measure mass by moving particles through electromagnetic fields. They assume that if the attraction curve toward the positive pole is the same as toward the negative pole, then, anti-particles and particles must have the same mass. This is difficult to believe because the evidence shows that the negative charge (in reality positive charge) is involved with absorption of matter and the positive charge (in reality negative charge) is involved with the emission of matter in reaching the nonmatter of the anti-matter state. One is a positive energy addition (+) and the other is a negative energy subtraction (-). The same curvature in the electromagnetic field does not mean they have the same mass. The same "mass" is an assumption based on the belief that cause and effect

are derived only from physical origins. This parallels the belief that mass is somehow attracted to mass when the evidence shows that mass (1) is attracted to nonmass (0). Two particles of opposite charge cannot have the same mass if in fact one is in a filled condition and the other is in an empty condition. An empty (-) negative energy particle (anti-particle electron) curves toward the electromagnetic pole that represents the filled (+) condition and the filled (+) positive energy particle (electron) curves toward the electromagnetic pole with the empty (-) condition. There is a 1-to-0 attraction in both examples, except that the positions of 1 (+) and 0 (-) is reversed when comparing one example with the other. The magnitude of the curve of matter and anti-matter within the electromagnetic field is the same because in each case the same 1's and 0's influence each other. The 1 (+) of the electromagnetic pole attracts the 0 (-) of the anti-matter particle and the 0 (-) of the electromagnetic pole attracts the 1 (+) of the matter particle. The curve is the same for both. The conclusion is that anti-matter states for objects represent a negative energy subtraction of matter and matter states for objects represent a positive energy addition of matter. The amount of matter involved is different for both matter and anti-matter.

It is interesting that Dirac's empty space which he depicted as a sea of negative energy particles and the charged hole created within this already empty space, do not today seem to be a part of how physicists view anti-matter. How can both have the same mass if one is a hole and the other is a filled hole?

With a new view of particles, where the particle with the empty (0) has a negative charge and the particle with the full (1) has a positive charge, it is unnecessary to view empty space (mass-less space) as being anything more than empty. It is not necessary to invent a "sea of negative energy particles" because negative energy is the nothing of empty space and the opposite of the positive energy of the something of filled space. The mass-less concept of space is the nothing of the organized hole that has always existed. Dirac's perspective requires only the concept of empty space. The hole of nothing is the negative energy attracting

the something of positive energy. Thereby we can get back to what is observable. A conclusion here is that filled electrons have absorbed photons and empty anti-matter electrons have emitted photons. Photons represent energy and are attracted to the empty space that is part of the physical framework of the empty anti-matter electron. After absorption the anti-matter (negative energy) electron reaches the filled matter state of positive energy.

All we need to do is recognize that all particles fluctuate between empty-matter states (anti-matter) and the full-matter states (matter). The emission process causes a particle to change from a positive filled state to a negative empty state known as anti-matter. The absorption state changes a particle from a negative anti-matter state to a positive matter state. From this we may conclude that all particles are their own anti-particles. For their own survival and viability they and we fluctuate between both postures — matter and anti-matter states. Anti-matter is "alive and well" in nature.

Why don't we see anti-matter? Because we have failed to see what it represents. When experiencing starvation we are in a severe anti-matter state. Whatever our body needs and is deprived of, places us in anti-matter states. All empty containers are in anti-matter states. The empty anti-matter state attracts us to the use of emission in gaining the filled matter state of absorption. .

Why do we not perceive more of a balance between matter and anti-matter states within the atomic world? We do observe positrons and other anti-matter particles during collisions created by particle accelerators. Why are anti-matter particles released by these collisions? They must be part of the atom. The atom is a complex series of emission and absorption events. These are exchange processes between the states of matter (positive charges) and anti-matter (negative charges). They occur around and within the nucleus. They emit and absorb using the force of repulsion and attraction. As an example, the bands that electrons occupy around the nucleus depend upon the electrons' energy state. The more energy they absorb, the further the distance of their orbit from the nucleus. The electrons that occupy the outer

bands have more positive energy (matter states) than the electrons closer to the nucleus which carry more negative energy (anti-matter states). As electrons around the nucleus absorb the energy of motion from photons, they move up the energy ladder from a nonmatter state to a matter state. An increase of positive energy is always an addition (+) process. When electrons emit energy (photons in motion) they move down the energy ladder closer to the nucleus. This is always a subtraction (-) of energy (motion). What happens in subtraction? An empty is reached and is defined by the organized space of anti-matter (nonmatter). The addition of energy actually subtracts the 0 of anti-matter and the subtraction of energy adds the 0 of anti-matter. For example when pumping (subtracting) heat (energy) out of a refrigerator, it is in more of an anti-matter state.

Thermodynamicists know that areas of high energy are induced to move to areas of low energy. The high-energy matter state of the 1 is attracted to the anti-matter state of the 0s of the low-energy state. For the same reason hot moves to cold. Hot is an increase of emission and absorption which creates more filled matter states and cold is a decrease of emission and absorption which creates more empty anti-matter states. Hot is the excess of a positive energy state attracted to the cold which is a deficit of a negative energy state. Hot is the excess of the 1 attracted to the cold deficit of the 0. Hot is an excess of 1s and a deficit of 0s while cold is an excess of 0s and a deficit of 1s.

All nature oscillates and fluctuates between matter and anti-matter. Oscillation creates the anti-matter phase to be able to return to the matter phase of absorption.

Energy is a difficult phenomenon to understand. Even knowledgeable scientists talk around it and have difficulty defining it. In a following chapter, energy will be defined for the mind showing its relationship to matter.

The entire atom is an oscillator involving emission and absorption, anti-matter and matter, negative and positive, empty and fill and off and on events. In each set of these opposites, one opposite of each pair of opposites is directly related to the 0 and the

other is directly related to the 1. These opposites illustrate nature's binary action. The atom is a derivative of this action, and objects created by combinations of atomic structure are based upon the same principles. Nature is a balanced symmetry of rhythmic exchanges between matter (1) and anti-matter (0) states.

We do not come in direct contact with atomic anti-matter states because they exist within the atom's inaccessible structures. Each atomic fill is a matter state and each atomic empty is an anti-matter state. To take apart any structure is to destroy its specific anti-matter (0) geometry. Free electrons are in a positive matter state because they gain energy from this filled state. Absorption is a transfer of energy to the absorber giving the absorber the energy of motion. Free electrons have absorbed enough energy to gain lift-off from the atom. Free anti-matter electrons (positrons) appear to have a short existence and their stability requires them to be part of atomic structure. This is because of less energy in anti-matter states.

Many of the paradoxes of contemporary physics can be obviated by resurrecting the concept of empty space as empty. But now contemporary mathematics presents "empty space" as an inexhaustible supply of particles. These particles are said to pop in and out of existence from what was earlier thought to be the nothingness of empty space. These so-called particles are named virtual particles and the moving in and out of nothing is named vacuum fluctuations. Virtual particles, however, are something less than particles. It is believed that somehow they produce the effect of a particle without being actual particles. They have now arrived at a hypothesis that does not fit observational evidence. How can "virtual particles," less than real particles, come from what is already empty? In their search for explanations of nature, scientists have insisted on using the physical to explain everything. They use these virtual particles to try to explain forces between particles. For instance, the repulsive force between two electrons is explained by the exchange of virtual photons. This exchange of virtual photons, it is said, causes a rebound effect

that results in electrons repelling each other. This is a mathematical invention used to explain the phenomenon of repulsion.

Instead of building upon this contrived hypothesis of virtual particles, it is easier to view repulsion as I have shown. Repulsion effects come from 0-on-0 and 1-on-1 encounters. Repulsion occurs because an exchange (emission to absorption) cannot take place. Two free electrons are both in a filled and positive energy state. This is a 1-on-1 of repulsion because there is no possibility of a 1-to-0 emission reaching absorption. Why would electrons exchange the positive energy they already have and the energy necessary to be in this free state outside the atom? This is the energy that allows their existence beyond the atom. Also, there would be a repulsion between two positrons (anti-matter electrons) without the exchange of these presumed virtual particles. These two anti-matter electrons create a state of 0-on-0 repulsive opposition. Similarly, the attraction for an antielectron positron (empty) and an electron (full) for each other is due to the 0 of the antielectron positron and the 1 of the electron. However, in this case there are two 0's — one filled and one empty — with no possibility of a fill for both. The prediction here is that this is the reason for the disintegration of an antielectron (positron) and electron when they come together. Their disintegration is a return to particles that can reach absorption for energy usage. Apparently, manageable and stable emission and absorption events for electrons are more likely to occur within atomic structure.

Similarly, notice that humans are repulsed (1-on-1 and 0-on-0) by their inability to achieve absorption (1 into 0). To explain this repulsion mechanism for humans it is not necessary to contrive a "virtual" exchange process.

The point is that by using the 0 and 1, attraction and repulsion forces can be explained without the need to exchange "phantom" particles and disrupt the beauty and simplicity of nothing.

The term vacuum fluctuations need not be discarded. It can be used to describe the geometrical vacuum of nothing as it appears and disappears with the emission and absorption of matter.

In John Gribbin's book, *In Search of Schrödinger's Cat,*[1] he discusses the Parity Change Theorem (PCT):

> It is the PCT theorem that is the basis of the assumption that the emission of a particle is exactly equivalent to the absorption of its anti-particle counterpart.

This is a startling statement for a world that is not supposed to show anti-particles. In scientific language, the word *equivalent* means that something is exactly the same as something else. Not just equal to something, but the same in every conceivable way. To me, this statement admits that we have misunderstood the reality of an anti-particle. Science is perplexed because it does not see what would be expected to be a balance between matter and anti-matter, and yet we experience the everyday normal events of particle emission that are exactly the same as the absorption of its anti-particle counterpart. Every time there is an emission of matter, there is a simultaneous absorption of anti-matter. There has been difficulty in describing anti-matter; however, it is the same as the emission phase of regular matter. It is obvious to me that we have missed something of fundamental importance because the clues to understanding are unseen. Like the counting board, we have looked without seeing. This is at the same time incredible and understandable.

The PCT theorem that the departure of an object is the same as the arrival of an object (an anti-particle) is, indeed, strange. But it becomes comprehensible when we introduce the organized hole and make it a viable and necessary partner with the physical world. To perceive this we must include both the physical of an object and the nonphysical hole the object uses for absorption. For an emission phase to take place, it must be preceded by absorption. Absorption (arrival) is always prior to emission (departure). What occurs to the object during emission? The object's prior full condition is changing to an empty condition. As

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[1] Gribbin, John, 1984. *In Search of Schrödinger's Cat.* New York: Bantam, page 263.

the object emits a 1 the empty of the 0 emerges at the same time. The departure of something (1) creates the arrival of nothing (0). The departure of matter (1) is the same as the arrival of anti-matter (0). The emission of the 1 of matter is equivalent to the absorption of the 0 of anti-matter. This equivalence is now explained. The significance of nonmatter — which is anti-matter — has been lost precisely because it remains unseen. Nonmatter (anti-matter) is not obvious precisely because it is unseen. Anti-matter is an organized area of nonmatter. The borders giving this organized area form and shape to nonmatter (anti-matter) are defined by the physical framework of an object. In the same way, the 0 of the empty truck is an anti-matter state (nonmatter state) organized by the truck's physical framework. Anti-matter and organized nonmatter are interchangeable concepts that always require the presence of a physical framework for the 0's organization. The written symbol 0 is the anti-matter of nonmatter organized by the physical framework of ink that surrounds it.

From the PCT theorem that the emission of a particle is equivalent to the absorption of its anti-particle counterpart, it follows that the emission of an anti-particle is equivalent to the absorption of its particle counterpart. When the absorbed (particle) arrives for the absorber there is at the same time a departure of the anti-particle (0 of no particle). As nothing departs something arrives or when something arrives nothing departs. It seems incredible that nature could be so simple, but it is the principle that is simple. How matter (1) and anti-matter (0) fluctuate within a structure can be complex. In contrast, the matter and nonmatter of a drinking glass are a simple structure illustrating a simple principle. To fill and then empty the glass is to go from a matter state of the fill to an anti-matter state of the empty. Absorption creates a matter state and emission creates an anti-matter state.

The principles behind our existence parallel those for the rest of nature. With this new perspective on the presence and reality of anti-matter in the universe there is the necessary balance between matter and anti-matter.

MAGNETIC POLES AND ELECTRICAL CHARGES

As described toward the end of Chapter Four, objects (1) in motion are continuously and simultaneously entering a 0 forward and emptying a 0 behind. An object (1) in motion is expressing its changing use of its field (0). Motion is an object's continuous filling and emptying of its 0 field. The 0 field used by an object's motion continuously disappears forward and reappears behind. Motion is an expression of the object changing a 0 to a 1 in front, as it moves and at the same time is changing a 1 to a 0 behind as the object is leaving. Within a magnet there is a uniform direction of atomic motion. Binary theory predicts that the magnetic north and south poles are expressions of the 1 and 0 foundation as the 1 uses its field (0) during motion. The uniformity of direction for atomic motion within magnetic material reveals this uniform use of the field as the 0 field disappears forward as the object fills the 0 field. As the field disappears forward the 0 field reappears behind as the object empties the 0 field. It is a 0 changing to a 1 forward and 1 changing to a 0 behind. The north and south poles of a magnet show the uniformity of the 1 and 0 changes during motion. When atomic motion is not homogeneously directional, the 1 and 0 are random in their arrangement. This randomness of motion's direction does not show the magnetic poles — as in a magnet — with their directional uniformity of the 1s and 0s. The uniform direction of motion explains the magnetic effects around a wire conducting electric current. An electric current also represents this homogenous nature of the electron's direction of motion. The electrons being conducted within the conducting wire have the same direction of motion. This electric current (the electron's motion) is expressed by the 1 of the electron forward and the 0 of the nonelectron (no electron) behind. The magnetic field around the conducting wire exhibits the 1's use of its field (0) during motion. The conclusion here is that magnetic effects are related to motion. These effects are not displayed in the whole magnetic body until large amounts of motion within the body occur in the same direction.

This explains the relationship of magnetic poles to electrical charges. To see this connection, it is necessary to separate position from motion. The binary magnetic poles represent the 0 and 1 during their continuous changes during motion — changing to a 1 forward and a 0 behind the 1 of the object in motion. The binary electric charges of positive and negative represent the after-motion states of 0 and 1. Magnetic poles are 0s and 1s expressed during motion and electrical charges are 0s and 1s expressed after motion. Binary magnetic effects are examples of the 0 and 1 usage during the emitted object's motion. Binary electrical charges are examples of the 0 (negative charge) of an object after its emission and the 1 (positive charge) of an object after its absorption. Motion is the energy used to reach the empty anti-matter state of a negative charge and the full matter state of a positive charge. Charges show the positional nature of the positive fill of the matter state for an object and the negative empty of the anti-matter state for another object. Magnetic poles exhibit the in-between state of motion used to reach the empty of the negative charge and the fill of the positive charge.

It has never been understood why electrical charges can be separated and magnetic poles cannot be separated. The many attempts to separate magnetic poles into monopoles have been unsuccessful. This is explained by the 0-and-1 nature of magnetic poles during motion. To separate poles of a magnet is impossible because these poles represent motion. Motion cannot be divided because either motion exists or it does not. To stop motion is to stop the magnetic 0 and 1 expression during motion. The 0 and 1 continuously change during motion. Without the 1's changing use of its 0 field, there is no motion and no magnet.

During positional absorption there is no relative motion between the absorber and that which is absorbed. The continuous changes during motion have ceased. The absorbed object has entered the hole of the absorbing object creating a nonmotion relationship between them both. This nonmotion relationship creates a positive filled condition for the absorbing object and a negative empty condition for the emitting object. Magnetic poles are

energy's motion used to reach the difference between objects and their separate positive matter states and their negative anti-matter states. Electrical charges showing the apart phase for the 0 and 1 are expressed by separate objects in the anti-matter state (0 of negative charge) and the matter state (1 of positive charge). Motion shows the binary (0 and 1) together phase during motion while charges show the binary apart phase after motion. Whether they are apart after motion or are together during motion, the 0 and 1 still exhibit their interdependence.

It is necessary to separate position (absorption) and motion (emission) to understand the difference between magnetic poles and electrical charges. Magnetic poles and electrical charges demonstrate the difference between emission (polar 0 and 1 magnetic effects during motion) and absorption (0 and 1 electrical charge effects after motion). Contemporary difficulties of interpreting nature are primarily involved with the prevailing misconception that position and motion are simultaneous events. Motion demonstrates energy, wave, emission and magnetic effects, while position demonstrates nonenergy, wave cessation, absorption and the electrical charges of positive (1) and negative (0). The cessation of motion at absorption completes the positive charge of an object's filled state and also completes the negative charge of the empty state for another object. A positive charge always results in a negative charge.

CHAPTER 8

Renormalization, Time (1) and Nontime (0), Mass and Energy

A PROBLEM ARISES out of current attempts to explain nature always in terms of energy and matter. Physicists have mathematically surrounded the electron with a vacuum cloud of virtual photon particles that are said to "pop out" of the vacuum cloud, after which the electron reabsorbs the virtual photon particles. When the rules of quantum mathematics are used to determine the amount of energy involved in these processes, the mathematical conclusion is that the electrons and their clouds possess infinite mass/energy.

The difficulty with these mathematical conclusions is that electrons do not have infinite mass. To overcome this problem, physicists do something that defies mathematical rules. They cancel out the infinities by dividing both sides of the equation by infinity. These rules of mathematical convention are violated to reach the answers they are looking for. Physicists call this *renormalization.* Even after canceling out the infinities, quantum mathematics ignores the amount of the electron's mass. Because physicists already

know the amount of the electron's mass, they arbitrarily — ad hoc — plug it into the equation to reach "satisfactory" conclusions. But in so doing they have created a paradox: how to deal with infinite mass/energy. Something is wrong.

This paradox stems from their artificial creation of an electron that continually generates energy from its cloud of virtual photon particles (which is less than *something* that comes out of *nothing*) and is *continually* reabsorbing this energy. This problem and paradox would not arise if the 0 of the anti-matter state and the 1 of the matter state that are the basis of the electron's nature were understood. For the electron to function, it must both absorb and emit. Contemporary physics has failed to identify the 0 of anti-matter states after emission and the 1 of matter states after absorption. Absorption places the electron in a positive energy state and emission places the electron in a negative energy state. Understanding the balance between these two states of negative and positive energy and including them in the mathematics will remove the counterintuitive paradox of infinite mass/energy.

To understand electrons it is important to contrast the electron's emission and absorption of a particle (photon) with its absorption and emission of the 0 of nonphotons. As the electron emits a 1 it absorbs a 0 and when it absorbs a 1 it emits a 0. The electron emits and absorbs photon matter states and the electron emits and absorbs the nonphoton anti-matter states. This provides the necessary symmetry and balance to remove the questionable conclusion of infinite mass/energies.

TIME (1) AND NONTIME (0)

What is time? Volumes have been written on this difficult subject, but after much searching, I found the answers to what time represents to be unsatisfactory. What is presented here is an interpretation of the nature of time.

The equations of Newtonian mechanics enable physicists to treat time as traveling both forwards and backwards. The mathematics has no restrictions on reversing time. Why is this convention allowed when it is observable that events travel from past to

present? Both natural and human events move toward the future and not toward the past. Observation shows that time moves forward and not backward. Time is unidirectional: an arrival in the present is dependent upon a departure in the past. To reverse time is to claim the past is dependent upon the present.

Humans are dependent upon the accumulation of past knowledge to reach future emission to absorption events. How can we retain our memory of the past and at the same time physically return to a past that has not yet produced any stored memories? To go to the past necessitates the past becoming the present. If we could retain knowledge from reversing time, it would mean we could have knowledge of the future. However, we can never know the exact future in advance. Our acquired knowledge depends upon past events up to the present. To travel backwards in time would negate all the episodes of our experiences between the point traveled back to and the present. Even if we could, what is the point in traveling backward in time if there is no retention of our experiences acquired forward in time? The question is, how is it possible to remove events that have already transpired in order to move back to a previous existence? Observation indicates a reasonable conclusion that this is not possible. The ability to return to the past has never been demonstrated.

Instead, let us approach traveling backward in time as a faulty interpretation and use of the Newtonian equations. What is there about Newton's equations that allows a reversal of time in a universe that does not allow it? A definition of time is necessary to answer this question.

A clock provides humans with two processes. One is position and the other is motion. Position is obtained by identifying a specific time of day. When we want to measure *how much time* we construct a length for motion. To establish a time of day the mind reaches an assumed fixed position for the motion of the clock's hands. This position of the hands relates directly to our position on earth relative to the earth's assumed position with the sun. Knowing our positional relationship with the earth and the earth's relationship to the sun enables us to determine and reach posi-

tions relative to the things around us. We can then schedule our time and acquire future fixed positions in time with other objects of choice.

To ask *how much time* occurred is asking how far the hands of the clock — moving at a constant rate — moved between the assumed positions for the hands. Assumed position for the hands before and after motion gives us a defining process for the length of motion. Asking *how much time* has passed is asking what is the LENGTH of motion. The question, *what time is it,* is answered by the assumed positions of the hands of the clock. A stop watch identifies actual position for the hands relative to the watch and ourselves by stopping the hands' motion. Stopping the hands gives the observer a fixed positional location for the hands.

The *motion* and *position* of a clock are necessary to define each other. Motion is used to reach the nonmotion of a fixed positional *time of day*. The nonmotion of fixed positions is used before and after motion to measure how much motion occurred. *How much time* is all about motion and the *time of day* is all about position. A clock is referred to as a "time piece," but in reality a *clock* is both a *time piece* and a *motion piece*. This follows the principle that all structures — human and nonhuman — use both motion (emission) and nonmotion (absorption). This dual necessity of motion and nonmotion (position) demonstrates the necessity of opposites in defining each other. It also shows the necessity of using one opposite after the other where motion is a prior requirement of position and position a prior requirement of motion. Opposites are never simultaneous. Motion is used to reach position and position is used before and after motion to frame the length of motion. Motion is a prior condition for defining position and position is a before and after necessity for defining motion.

The example of the clock shows that to *know time* is to reach a fixed position for the clock, which relates our position with the assumed position of the earth relative to the sun. Is the mental absorption (non-motion) of fixed locations for the clock a time

occurrence? *Is time itself a positional representation?* Are time and position synonymous?

Nature's actions have demonstrated the two stages of motion (emission) and position (absorption). The common phrase *time and motion* blends time with motion. My own observation is that *time is position* which means time and motion are separate in their occurrence, but are together in their dependency on each other. To believe that time actually occurs during motion is to involve both position (absorption) and motion (emission) simultaneously. Instead of time being simultaneous with motion, time is the opposite of motion. Time is the nonmotion of position (absorption) necessary to define motion. Motion (emission) is necessary to define the nonmotion of position (time). And motion is also the energy process of an object necessary to reach a state of time (absorption).

To ask *how much time* has passed is an imprecise question. The precise question is *how much motion* has occurred between time events: between the start and stop of motion. To determine two hours of elapsed time on the clock, we mentally stop the motion of the clock for the first positional notation to start the two hours of motion (e.g. 12:00 o'clock). In "telling time," we perceive a specific position (time) on the clock for the start of motion. Time is POSITION. The clock's positional starting place of the two hours is like the runner's positional starting place before a race. From this first position, we mark the beginning of the runner's motion as we mark the beginning of the clock's motion. When two hours have elapsed (from 12:00 to 2:00 o'clock), we come to a second state of absorption (time) ending our use of the clock for this period of motion. The clock was used to relate two hours of the earth's motion-to-position with the sun and two hours of human motion-to-position with the earth. We surround the motion (emission) of the clock with time — position of start and stop — to reach a specific period (two hours) for motion. It is the assumed time (position) of the clock's hands before and after motion that frames (defines) this length of the clock's motion. It is assumed time because the hands of most clocks continue to move

when position is determined. The assumed position of the hands in motion represents a specific time of day; therefore, time is a positional and absorbing event as our thoughts are positional and absorbing events. Human absorbing processes are time events of position.

Time as a positional concept means that all mental measuring and defining processes are time events. The use of our senses involves motion bringing us objects for absorption (mental time events). Our sensory organs reach absorbing time sequences through motion (emission). To generalize, all absorbing processes are time events — human or non-human. The fillings of all holes are time events.

Although time is universal it is only relative to when an object absorbs. Each structure's amount and rate of absorption is different; therefore, the time pulse (a time event) for each structure is different. All structures have their own individual time pulses. As humans, each of us pulses with our own time. There is not a Universal Clock ticking the same time for all of us. All objects tick (pulse) with the time of their unique absorbing events.

It is not just the clock that shows time comparisons. Every structure in nature pulses with time at each of its absorbing events. Nature's time events define our existence. All definitions are measurements derived by reaching our time (position) events through comparing and relating to the time (position) events around us. Human survival depends upon the success of time comparisons. The clock is only one device among many for defining our relationship with nature.

By defining time as a positional process and then by separating it from motion, the question of why the Newtonian equations allow time to travel both forwards and backwards can be answered. Newton built his equations to define both the motions and the positions of objects, such as the moon and planets, that are in constant relative motion to ourselves and to each other. To accomplish this, Newton incorporated position as a simultaneous part of motion. As discussed, motion and position are necessary in defining each other. However, incorporating position during

motion is *assumed* position rather than actual position. Physicists have not recognized the significance of the difference between assumed positions during motion and their presumed and invented "actual positions" during motion. When time (positional nonmotion) is imposed upon motion and perceived as an actual and simultaneous part of motion, then time and motion cannot be separated. The motion of an object has been incorrectly imposed upon the separate occurrence of time, and positional time is incorrectly imposed on the separate occurrence of motion. When physicists reverse the motion of Newton's equations, time (position) is also reversed because the mathematical equations require time to be a synchronous part of motion. Without realizing that these mathematical positions during motion are an assumption of position and not actual position, there is an erroneous perception of a reverse flow of time (position) when reversing motion's direction. Newton's equations need only assume positional time during motion. Actual time in nature is never a simultaneous part of motion. In Newton's equations, even forward time conveys the false notion that time is continuous with motion. In the real world, position (time) and motion are separate. Motion, instead of being part of position, is used to reach position (time). The phrase "flow of time" incorrectly denotes time as a motional concept. The concept of flow is one of motion used to reach the nonmotion of positional time. Time itself is not directional. Direction is part of the motion used to arrive at time. The terms forward and backward are part of motion and it is misleading to use them in describing time. Direction is used for reaching time. Time is a description of the nonmotion of an object relative to its arrival in the hole of an absorber. To say "time marches on" can be more accurately restated: Objects march on in motion to reach time through arrival.

A time event is an arrival in the hole of an absorber. Future time events depend upon past time events of position. A time pulse cannot be reached unless motion starts from the present time event of arrival to reach a future time event of arrival. The time event of future absorption depends upon the departure event

of emission from a past time of position. Motion (emission) is a departure of time for reaching a new arrival of time. Time must always be forward because all present time events are dependent upon all past time events.

To arrive at the pulse of time is also to depart from a prior time event. The fill of the pulse of time for one object is provided by motion and it is this same motion that also produced an empty state for another object. Emission is the departure of time (1) resulting in an empty condition for an object. This places the object in a nontime (0) state. Absorption is the arrival of time placing an object in its filled time state. To absorb is to gain time and to emit is to gain nontime. To gain nontime is the same as the loss of time. Objects in nature pulsate (oscillate) between the two states of time (1) and nontime (0). The pulse of time is defined by the pause of nontime between the pulse of time. The switching of a switch is the beat and non-beat of time. The on is the beat of the fill and the off is the non-beat of the empty (nontime) required to both determine the beat and to return to another beat. To sense a beat or pulse is to gain awareness of the *on* part of the switch; however, this awareness is only possible with the *off* of a nonpulse between one *on* and the next.

Time is ill defined when we insist that actual position is a simultaneous part of motion. During motion, position is assumed, but it is not an actual position. The actual position of time is before and after motion instead of during motion. The "purpose" of motion is to reach a time event. The "goals" of all life forms are to reach positional time events. The spaces provided by the human heart must pulse with the time of filling these spaces for life to continue. Every structure has its own special time beat. If a structure is built to fill-and-empty one time, then it has one time beat. To live longer requires more episodes of time. Living is a life-and-death process. Life is a time event of absorption. A life (1) event must be preceded by the death (0) event of nontime[1]. To

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[1] See Chapter 12 for a discussion of Life (1) and Death (0).

reach a time event is to replace death (0) with life (1). Death is permanent only when life cannot continue with a time occurrence. Time for any structure stops when it is unable to absorb (fill). How long we live depends on these continuing beats of absorption. Our system must continually build and maintain 0s and the 1s that fill (time) and empty (nontime) those 0s. A structure's cessation of time signals its termination of absorption.

Nontime (0) is the antimatter state necessary for time (1) and the matter state. The wave (motion) produces both nontime and time. The beginning of the wave is the beginning of emission and is nontime for the object emitting. The end of the wave is absorption and time for the object absorbing. The wave is an object's use of the field of nothing for its propagation (motion). Emission is the wave required to produce the empty of the nontime state of anti-matter. The wave is also required for the fill of absorption that is the reaching of time and the matter state. The collapse of a wave is the departure of motion with the arrival of a time state. The starting of a wave is a collapse of the filled time state to the empty of the nontime state. Time and nontime are the charges of positive and negative states. Time is the positive (+) matter state and nontime the negative (-) anti-matter state. This integrates seemingly different concepts. *Time* is part of absorption, fill, position, addition, positive charge (+), one (1), arrival, wave collapse, and the matter state. *Nontime* is part of emission, empty, motion, subtraction, negative charge (-), zero (0), departure, wave, and the antimatter state. When seemingly different concepts are unified this gives evidence that we are moving in a correct direction toward greater knowledge. The connecting-things-together phase for the mind always advances our knowledge. The act of unification reduces the amount of absorption necessary for gaining more knowledge.

The question may arise, if absorption is time, then why not absorb and remain in a time condition? Time would then be continuous and unchanging. This would allow a continual presence of time. However, this would also result in a static and unchanging structure. The object would be suspended in a state of absorp-

tion. In reality every object is built to pulsate between time (1) and nontime (0). The frequency of these fluctuations varies with the geometry of the structures. If the in (time) and out (nontime) frequencies are too high or too low, the system will not survive. Humans pulsate with a multiplicity of time and nontime occurrences. Every absorption is a time-beat and every emission results in a nontime-beat. Every fill is a pulse of time and every empty is a nonpulse of nontime. An awareness of and the ability to have a pulse depends upon the in-between phase of not having a pulse.

Time is a simple concept of position — 1 entering a 0 — reached by motion (waves). Time relative to humans is rapid during the "good days" of many successful arrivals. An arrival is a time event of absorption. The "bad days" are when repulsion is rampant and motion is unable to reach arrival (time). Time moves slowly during the "bad days" because of our difficulty in reaching a time occurrence. When time moves rapidly, its beat is defined by the short periods of motion between beats. *Faster* time is a higher frequency defined by shorter periods of motion. *Slower* time is a lower frequency defined by longer periods of motion.

Physicists today consider time to be unceasing and that it always continues with an uninterrupted flow. However, time cannot continue unless it is discontinued and interrupted with nontime. Our paradoxical view of motion and position is the source of our inability to recognize the *on* and *off* processes of time. The perennial paradoxes of time, Zeno's paradoxes of motion, and Schrödinger's paradoxes of waves, all result from the erroneous conception that position is an actual and simultaneous part of motion.

Anti-matter is a state of nonmatter and an empty state of nontime for all objects. The matter state of an object is the filled state and the filled state is also a time state.

With this positional definition for time, let us examine a statement by Dr. Michio Kaku and Jennifer Trainer in their *Beyond Einstein*:

> In *QED [Quantum Electrodynamics],* Feynman noticed that antimatter traveling forward in time was indistinguishable from ordinary matter going backward in time. . . . Particles moving backward in time gave a new interpretation of the Feynman diagrams. Assume that we have an electron and antielectron colliding, releasing a burst of energy. If we reverse the arrow on the antielectron, making it go backward in time, we can reinterpret this diagram. In the new interpretation, one electron goes forward in time, releases a photon of energy, and the same electron goes backward in time.[2]

The theoretical physicist, Richard Feynman, theorized that antimatter traveling forward in time was indistinguishable from ordinary matter traveling backward in time. In the accompanying Feynman diagrams, the horizontal line at the bottom indicates the space used by particles and the vertical line at the left indicates a direction for time. When a particle is moving up it is said to be traveling forward in time and when a particle moves down it is said to be traveling backward in time.

The first diagram shows two particles in space moving up and traveling forward in time. The particle to the left is an *ordinary*[3] electron with a negative charge (that should be designated positive). The particle to the right is an anti-electron (anti-matter) with a positive charge (that should be designated negative). Both particles on a collision course disintegrate upon collision with a release of energy (photons in motion).

The second Feynman diagram shows only one particle in two different states. On the left, as in the first diagram, there is an ordinary electron traveling forward in time. When this electron emits, it releases energy (photons) and reverses its direction, traveling

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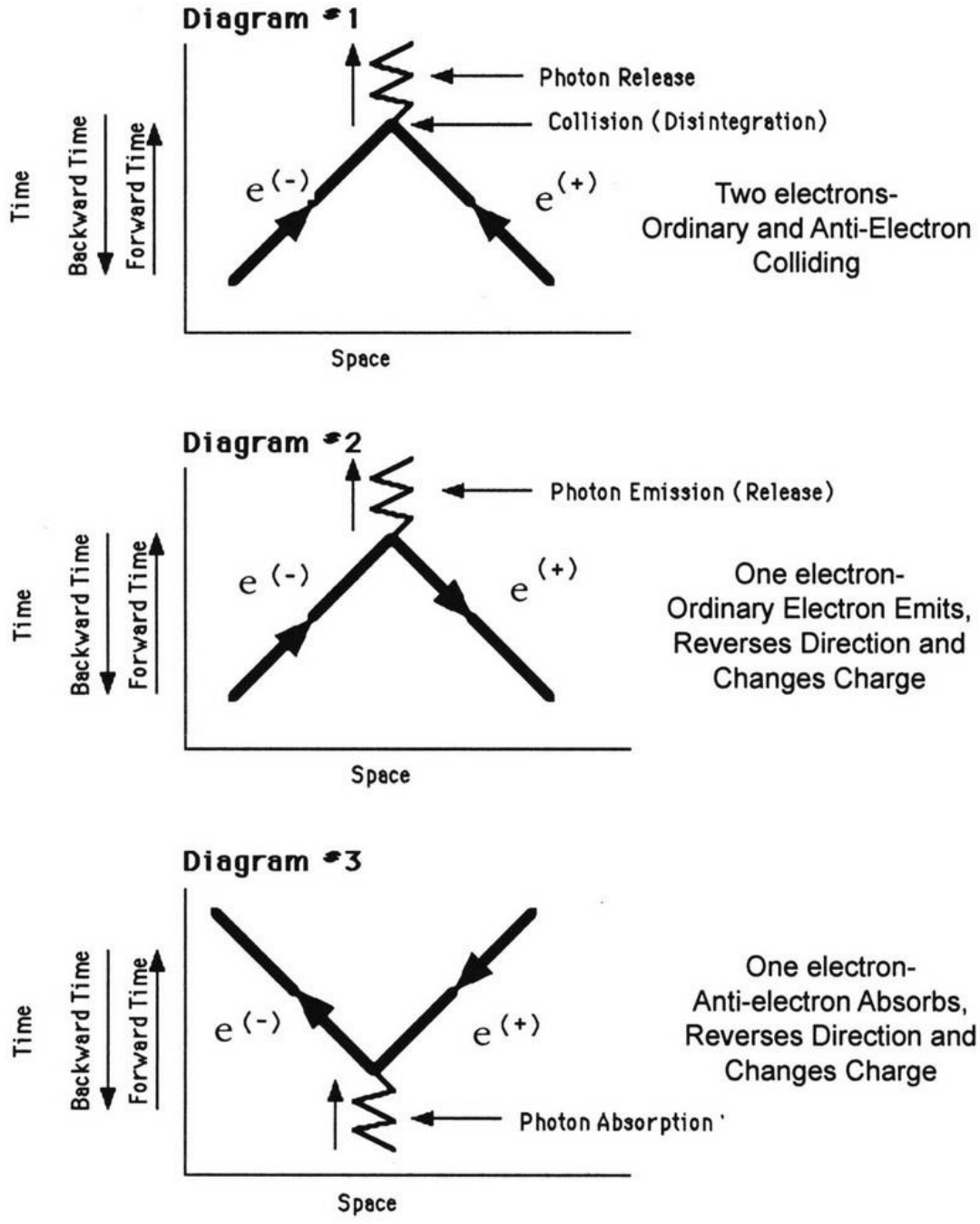
[2] Kaku, Dr. Michio and Trainer, Jennifer, 1995. *Beyond Einstein: The Cosmic Quest for the Theory of the Universe.* New York: Doubleday. Page 181.

[3] The phrase "ordinary" is used by physicists to differentiate ordinary matter from anti-matter.

backward in time. The ordinary electron having emitted and then traveling backward in time is now indistinguishable from the first diagram of the anti-electron traveling forward in time. In continuing this discussion, it may be useful to review Chapter Seven on matter (1) and anti-matter (0).



Feynman diagrams showing present interpretations of particle exchanges relating to time. Within this chapter these diagrams are re-interpreted.

Both particles on the right side of the first and second diagrams have the same charge and the only difference is in one of direction: one is said to travel forward in time and the other backward in time. This same charge for both particles indicates an anti-matter state for both. Did the ordinary electron in the second diagram become an antielectron[4] (anti-matter) when it emitted? Is an anti-matter state for the ordinary electron due to its emitting a photon, or is it due to the interpretation of physicists who require time to travel backward? All ordinary particles are emitters. Why does emission change the electron to mimic an antielectron? Can the action of emitting — characteristic of all objects — answer the salient question: where is all the anti-matter? Since the discovery of anti-matter in the early 1930's, physicists have been unable to explain why anti-matter does not reveal itself in the expected balanced state with "ordinary" matter.

My discussions of diagrams one and two follow present interpretations of QED. Now I will reinterpret Feynman's diagrams with my explanation of matter (1) and anti-matter (0). An ordinary electron is actually an electron in a filled matter state. An anti-matter electron (antielectron) is the same ordinary electron, but is in an empty nonmatter state. As the diagrams show, the signs for positive and negative charges have not been reversed since discovering Franklin's wrong guess early in the twentieth century. To correspond with reality the filled matter state should carry a positive charge and the empty nonmatter state a negative charge. The principle has been missed in physics that positive charges indicate the fill of addition (+) and negative charges indicate the empty of subtraction (-). This point is reiterated to avoid confusion concerning this departure in interpretation from Feynman's diagrams. Ordinary electrons in actuality are particles that oscillate between two states. One state is the filled matter state after absorption and

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[4] An antielectron, which is anti-matter, is also called a positron. If Franklin had guessed right it would probably be called a negatron.

the other is the empty anti-matter state after emission. The anti-electron traveling "forward" in time in the first diagram is in reality an ordinary electron in the empty nonmatter state. The electron on the left side of the first diagram is also an ordinary electron in a filled matter state. The first diagram shows the opposite nature of two electrons in their filled matter and empty nonmatter states. The electron in the *antimatter state* on the right side of the first diagram implies the electron's prior emission and the electron in the *matter state* on the left side implies the electron's prior absorption.

The second diagram shows only one electron exhibiting both of its ordinary natural states. An electron in a state of absorption (filled) appears on the left of the diagram and travels in what physicists claim is a forward direction in time. However, in reality, this electron in the filled (+) matter state now emits a photon and changes to the empty (-) nonmatter state of anti-matter. This empty anti-matter electron now changes direction. The claim by physicists that this change in direction is the electron traveling backward in time will be examined in this chapter. .

Now the indistinguishable nature between the anti-matter electron (on the right of the first diagram) and the electron after emitting a photon (on the right side of the second diagram) can be understood. The anti-matter electron of the first diagram is an electron in an empty state, as is the electron in the second diagram after it emits. They are indistinguishable because both are in the anti-matter state of empty through emission. As will be explained, these anti-matter states are in reality the empty states of nontime (state of not having time) for both electrons. Forward (up) and backward (down) should only show an electron's direction of motion for reaching the fill of matter states and the empty of anti-matter (nonmatter) states. And direction should only be part of motion for gaining time and nontime.

This dual stage — fill and empty — for the electron can be illustrated by the creation of a third diagram. The empty electron comes down from the top because the photon is not allowed to go backward in time. This diagram shows an electron changing

from an empty state to a filled state by absorbing a photon instead of emitting a photon as in the second diagram. The electron emerging from the right side of the diagram is in an empty anti-matter state and is said to be traveling backward in time. The electron then absorbs a photon which changes the electron to a filled matter state and is said to be traveling forward in time. The second diagram shows an electron's motion from a filled (1) state to emission and an empty (0) state. The third diagram shows the electron's motion from an empty (0) state to absorption and a filled (1) state. The second diagram is addition (+) moving to subtraction (-) and the third diagram is subtraction (-) moving to addition (+). Note the symmetry in nature's *on* (1) and *off* (0) binary oscillations. From these and other examples we may conclude that all objects function according to this principle.

The electron on the left of the first, second, and third diagrams are in the same filled matter state and are said to travel forward in time. The electron on the right of the first diagram in an anti-matter state is said to travel forward in time. The electrons on the right side of the second and third diagrams in an anti-matter state are said to be traveling backwards in time. This new view of electrons produces a dilemma for the contemporary view, namely, electrons in the same anti-matter state move both forward and backward in the physicists' requirement for time. If there are only electrons that oscillate between matter and anti-matter states, then why should the empty anti-matter state be required to exist in forward and backward time states? Part of the problem is our present-day view that time can run forwards and backwards when the observable world does not support it.

The difficulty with Feynman's diagrams is that they always require time to occur. An electron in an anti-matter state is required to travel forward and backward in time. In analyzing the problem, the key phrase in both "forward in time" and "backward in time" is *in time*. To state "in time" for the diagrams indicates that the electron must always be in a time state either forward or backward. Herein lies the problem: the electron in the empty ANTI-MATTER STATE is in reality in a state of being *out of time*

instead of *in time*. The empty anti-matter electron is always in a *nontime* state (out-of-time state) regardless of the direction of travel. The empty state, after emission, is a state of not having time (nontime). The electron's emitting process is a departure of the time state. The electron's filled matter state is always a time state regardless of which direction it travels. The electron's absorbing process is an arrival at the time state.

The solution for explaining the dilemma of electrons in the anti-matter state traveling both forward and backward in time is to not invent an electron that always exists in a state of time. The designated directions "forward" and "backward" should only be used for showing a direction for motion in reaching time and non-time states for objects. We can now devise an explanation for nature that fits reality. Whatever the electron's direction, a correct diagram should reveal an electron's empty state as a nontime (0) state and an electron's filled state as a time (1) state. In the first diagram, the electron on the left is in a time state and the electron on the right is in a *nontime* state. The vertical line on the left should only indicate, in this case, the up direction for motion. In the second diagram, a single electron on the left travels up in space in a state of *time,* emits a photon, and then travels down in space in a state of *nontime*. Again, the vertical line should only represent a direction for motion and not time. Time is only part of a particle that is in the absorption matter state of positive energy. In the third diagram, a single electron on the right travels down in space in a *nontime* state, absorbs a photon, and then travels up in space in a *time* state. To travel down and up is a function of motion's direction and not a function of time.

The object in a time state can be moving or not moving relative to other objects and still emit in reaching a nontime state. Also the object in a nontime state can be moving or not moving relative to other objects and still absorb in reaching a time state.

The difficulty arises when using the phrase *in time* for all objects, regardless of their state of being. The use of the opposite concept *out of time* is required for a clarification of being *in time.* All human awareness — knowledge and understanding — is

reached through the antonymic universe of contrasting opposites provided by the binary 0-and-1.

All objects reach a *time state* through absorption and reach a *nontime state* through emission. The difficulty in understanding time has followed the physicist's failure to recognize that an empty electron, after it emits, is the same as an anti-matter electron (anti-electron). For this reason the antielectron and the emitting electron are "indistinguishable" in the diagrams.

Time travel is "stepping" from one position to another where each additional step takes us from a past position to a present position. The future represents steps yet to be reached. And in between these steps (arrival) is the wave (motion) used to reach them.

The past leads to future time because the past is indicated by the departure of time. The departure of time is an object having the nontime state necessary to reach the present of a new time state. The past is a removal of time, providing the necessary 0 for the 1 to enter and become the time of the present. The oscillatory nature of the 0 and 1 are fluctuations of the present (1) becoming the past (0) through emission and the past (0) becoming the new present (1) through absorption. The future represents the possibility of a nontime (0) state being removed with the present of a new time (1) state.

ENERGY AND TIME

The equations of quantum mechanics deny an object the simultaneous existence of momentum and position. It was also noticed that time and energy also have this same relationship. Time and energy cannot have a simultaneous existence. This gave me the clue for the identification of the meaning of time. It occurred to me that time and energy have the same relationship as do position and momentum because both pairs are part of absorption and emission. Time is the positional event of absorption and energy is the motion that is part of momentum within the emission phase. This is additional evidence of how our understanding of nature can be integrated through the proper use and

vision of the 0. *Time* compared to *position, energy* compared to *momentum* were thought to be different concepts, but in the real universe are part of the same phenomena. *Momentum* is the *energy* used to leave one hole to reach the *positional time* of another hole.

MASS AND ENERGY

Mass relates to all tangible substances representing the physical part of nature. There is usually little difficulty for the human senses to experience mass and matter. Albert Einstein's Special Theory of Relativity explains that mass and energy are equivalent. That energy is equivalent to mass was a surprising disclosure for many. However, to state the equivalence of mass and energy is quite different from understanding its meaning. Indeed, a comprehensive understanding of energy remains an elusive concept. Past and present attempts to explain energy are analogous to circling a destination without reaching it. The physical sciences are still moving toward a specific definition of energy that is still without the knowledge state of absorption.

Energy exists in many different forms. These include electrical, sound, nuclear, heat, potential, kinetic, chemical and radiant energy. Any of these energy forms can be transformed into other energy forms. An energy *input* from one form of energy will result in an energy *output* to another form. A hydroelectric dam is an example wherein the input energy of water is transferred to the output energy of electricity.

Chapter Seven on matter (1) and anti-matter (0) revealed Paul Dirac's correct prediction of anti-matter through his concentration on the negative energy roots of $E=mc^2$. Prior to Dirac, physicists concentrated on the positive energy roots of $E=mc^2$. The existence of both positive and negative energy indicates opposites necessary to define any process. To understand one energy concept is to understand the other. In Chapter Seven, the conclusion was reached that negative energy is the subtraction of matter and positive energy is the addition of matter. During the emission of matter, there is a release and departure of energy. This results in the

nonmatter empty state of anti-matter. The anti-matter state is a negative energy state for objects after they emit. During the absorption of matter, there is an entering and an arrival of energy. This results in a filling of the matter state which is a positive energy state for objects that absorb. The conclusion is that absorption is an energy input and emission is an energy output. Input yields positive energy for an object and output yields negative energy for an object.

A question to consider is, if the arrival of matter (absorption) is positive energy and the departure of matter (emission) is negative energy, then how does energy relate to matter? This can be answered by determining how matter departs and arrives. What specific function is used by matter to leave the hole of one object and to arrive in the hole of another object? Humans also use this function in transporting the matter of their body from one place to another. Matter acquires action for its emission and absorption events through the function of motion.

A definition for energy can now be precisely stated: *Energy is the motion of matter relative to objects that subtract motion through the output of emission and relative to objects that add motion through the input of absorption. Energy output* (emission) is a negative energy process for the object emitting because emission results in a subtraction (-) of motion (energy). *Energy input* (absorption) is a positive energy process for the object absorbing because absorption results in an addition (+) of motion (energy).

More simply stated, energy can be defined as *mass in motion* or defined as *energy is motion*. The idea that motion and energy are equivalent produces a clear mental picture of this natural phenomenon. Energy is the motion used for all emission (departure) and absorption (arrival) events in nature. Energy becomes comprehensible by separating it from its beginning for an object at departure and its ending for an object at arrival. To understand a loss of energy by an object's output is to understand a gain of energy by an object's input and conversely; one defines the other. This view, however, is not possible without both the positive (+) fill of a hole and the negative (-) empty of a hole. The use of the

0 must first be identified before reaching a specific definition of energy. The insistence on energy (motion) being simultaneous with time (position) is the prime misconception leading to difficulties in interpreting nature. Identifying the nature of the 0 and the 1 as the 1 enters and leaves the 0 is necessary to designate opposites for the creation of definitions.

Energy transformations are restatements of motion transformations. Motion (energy) is transferred from one object to another by the output (emission) of motion and the input (absorption) of motion. The output of energy is a subtraction of motion for the emitting object that leads to an addition of motion (input of energy) for the absorbing object.

The conservation laws of mass/energy involve conservation of the physical (mass) and the motion (energy) used by the physical for its *in* and *out* events. The law of conservation of mass/energy can now be stated: *Mass and the motion/energy of mass cannot be created or destroyed; the amount of mass and the amount of motion/energy of mass is always conserved, but the shape and form of mass will change and the input and output transfers of the motion/ energy of mass will change.*

Human absorption of food, air and water extracts the internal motion of these essentials for our energy input. This extracted motion is then stored as potential energy for its future use as kinetic energy that is the human body's motion. Motion has been transferred from the internal structure of food to the internal structure of humans. The use of human motion is another energy output leading to an energy input for the objects absorbing human motion. We input energy by taking motion away from objects and in using it we give it back. Energy (motion) is always conserved by its continuing transfer through input (absorption) and output (emission). It is the motion (energy) of matter using the nonphysical that explains universal action. The departure of motion gives us information on an object's output and its loss of energy (negative energy). The arrival of motion gives us information on an object's input and its gain of energy (positive energy).

Energy is motion that is manifested in a wave. Energy (motion) is used through the attraction force with its availability of the 0 and 1. The repulsion force guides this motion (energy) and is responsible for the transfer of motion to the absorber. When motion enters the hole of the absorber, the hole contains and stops motion. But motion does not disappear; it "relocates" by becoming part of the absorber. The absorbed object gives its motion to the absorber. The absorbed is now part of the motion transferred to the absorber. This is the positive energy (matter state) for an object absorbing. Absorption occurs because the motional energy transfer has resulted in a nonmotional relationship between the absorbed and absorber. Energy ceases relative to the absorbed and the absorber. Energy absorption occurs when the positional time event is reached. The motion of the absorbed is transferred through repulsion — where the absorbed cannot go — to the absorber. The absorber now has the energy (motion) input to use attraction (1 to 0) in moving to where it can go. The absorbed is now carried along with the absorber's acquired motional energy from the absorbed. The attraction force uses energy (motion) for its arrival and then the repulsion force transfers this energy for another arrival. The repulsion force both guides motion (energy) and transfers motion.

Precisely because energy is motion, energy is always used when there is an absorber to absorb this energy from the absorbed. According to the law of conservation of charge, there is always available an empty (-) object to provide the energy input of absorption. For every emission creating an empty (subtraction) negatively charged (-) state, there is also an absorption creating the fill (addition) of a positively charged (+) state. The conservation of charge is also the conservation of matter (1) and anti-matter (0). The matter state is a positive charge and the anti-matter state is a negative charge. This indicates that energy always has the availability for absorption, that is, energy (motion) entering the 0 of an anti-matter absorber.

Positive and negative charges apply to all objects and are not merely limited to the electromagnetic domain. All objects

exchange (absorb and emit) in reaching a positive and negative charge. Every structure — microcosm or macrocosm — reaches its own positive (matter) and negative (anti-matter) fluctuations according to how it is structured to emit (-) and absorb (+).

An example of motion transfers (energy transfers) is the ignition of fuel (emission and motion of heat) followed by the transfer of heat motion to water motion (steam pressure) and then the transfer of steam motion to turbine motion. This is followed by turbine motion to generator motion, then generator motion to electron motion which is transferred to an electric lamp and the motion of radiant energy (motion of light particles). In each of these conversions and transfers of energy, motion is used to explain energy. The in of motion leads to the out of motion and the out of motion leads to the in of motion.

Physicists have understood for more than a century that high energy moves to low energy. *High energy* is an area of *positive energy* (addition of energy) which is synonymous with *higher* (more) *motion* and *low energy* an area of *negative energy* (subtraction of energy) synonymous with *lower* (less) *motion*. Why is high motion attracted to low motion? High motion in one area means an increase of emission and absorption. With higher oscillation, the availability of 0s is reduced. Lower motion is a decrease of emission and absorption with more 0s available. The attraction of high motion to low motion is the positive energy attraction of 1s to the negative energy attraction of 0s. This principle describes nature's attempt to reach a balanced state of positive (1) and negative (0). The more 1s the less 0s and more 0s the less 1s. This imbalance of 0s and 1s is what drives the action of high energy to low energy.

A wave is energy (motion) that is continually providing objects with accessibility through entry into an organized hole. Upon entering a hole, this energy is absorbed (transferred) and is followed by another emission-to-absorption event. There is an input to reach another output to reach another input, and so on the cycle continues.

Motion and energy are continuous as inputs result in outputs and outputs result in inputs. However, negative energy is a discontinuation of energy after output. There is a nonenergy (negative energy) state for every energy (positive energy) state. The empty anti-matter state follows a release of energy, while the filled matter state follows the arrival of energy. The universe, instead of being composed of only energy, is an overall combination of balanced states of energy and nonenergy. The arrival and use of energy (motion) indicates the prior condition of nonarrival and nonuse of energy.

Energy and time means *motion and position*. To describe energy is to describe waves. Objects use energy (waves) for propagation (emission) for entering the hole and a positional time event. Energy output, emission, momentum and wave are all related by the concept of motion toward the hole of an absorber. Energy input, absorption, position and a collapse of the wave, are all related by the concept of nonmotion outside the parameters of the organized hole of an absorber.

Physicists have noticed that in the equations of quantum mechanics *energy* and *time* do not commute in the same way that *momentum* and *position* do not commute. To not commute means that to have only energy or momentum is the exclusion of time or position. To not commute is the inability to have either energy and time or momentum and position as simultaneous events. I have concluded that energy and time have the same relationship with momentum and position because each pair is composed of emission and absorption. Energy and momentum are part of the stage of emission while time and position are part of the stage of absorption. Time is position (absorption) and energy is momentum (emission). Because time and position involve absorption and energy and momentum involve emission, it can also be concluded that emission and absorption do not commute. The inability to mathematically commute is a mathematical statement for the inability of emission and absorption to exist simultaneously. Energy to time, momentum to position and emission to absorption do not commute mathematically because quantum

equations are involved with the actualities of momentum and position. Quantum reality is a reality of nature where position is not allowed to be placed upon motion and motion is not allowed to be placed upon position. A particle's position within the wave function (motion) is denied for this reason. The mathematics is denying the claimed simultaneity, namely, the actual simultaneous existence of motion and position. To be certain about position (time) is to have the uncertain ignorance of momentum (energy) because momentum ceased with its positional arrival. To be certain about momentum is to have the uncertain ignorance of position because positional absorption ceased with the emissional momentum. Certain means knowledge and uncertain means ignorance. Certain and uncertain are opposites that revolve around each other — one after the other. The uncertainty of position is the existence of motion reaching for the certainty of position. The uncertainty of motion is the existence of position necessary to start the certainty of motion.

To integrate time, position and absorption as one concept and energy, momentum and emission as another concept is to show that one is involved with occupying a hole and the other is involved with leaving a hole. One concept involves input and the other involves output.

Energy is matter in motion and mass is matter's positional relationship in nonmotion. One is *energy/mass* and the other is *positional/mass*. Mass and energy are always relative to the observer. What may mean positional/mass for one observer may mean energy/mass for another observer. Positional/mass is *arrival* and energy/mass is *departure*. While aboard an airplane in flight, human mass has a positional/mass relationship to the airplane and at the same time has an energy/mass relationship to the earth. Concurrently, human mass on the earth has a positional/mass relationship with the earth and an energy/mass relationship to the airplane.

All human mental absorption is a positional/mass relationship of arrival and depends upon the prior condition of departure and the energy/mass of motion. Mass and energy, thus, are not equiv-

alent relative to the observer. Either the energy/mass (emission) of the wave exists disallowing observation, or positional/mass occurs allowing observation (absorption). Mass at rest is a positional (static) relationship relative to any other object. Energy is mass in a motional relationship relative to any other object. Newton's first law of motion concerns mass in a state of rest and mass in a state of motion. Positional/mass is simply mass in a state of rest (absorption) relative to any other object and energy/mass is mass in a state of motion (emission) relative to any other object.

When we sense heat (1) it is motion (energy) being transferred through absorption to us and when we sense cold (0) it is motion (energy) being transferred away (emission) from us. We can receive too much energy — to our detriment — or too much energy can be taken away, also to our detriment. In fewer words, we can have too much input (absorption) or too much output (emission). We can acquire too many 0s (negative energy) by the departure of 1s, or too many 1s (positive energy) and the subsequent departure of 0s.

Nuclear, electrical and fossil fuel energy conversions provide additional motion that allows humans easier and more rapid emission-to-absorption processes. Access to more motion (energy) increases our time events, enabling us to emit and absorb faster. The conversion of machine motion to the facilitation of human motion adds to life (time) and is the basis of survival for the vast majority of humans.

CHAPTER 9

WAVES

A HUMAN RELATIONSHIP with the material elements of nature necessarily includes a relationship with the nonmaterial as the physical in nature always involves the nonphysical. The reverse is also true because the intangible cannot be isolated from the tangible because there is always an inseparable involvement with both. The existence of one is determined by the other. Definitions correctly describing a natural state of existence must always include the 0 and 1. Waves represent a natural state of existence.

Newton proclaimed that light was made up of particles. A century and a half later, the English physicist Thomas Young showed experimentally the wave characteristics of light. It had been determined by physicists that waves were not particles. It was soon concluded that light was a wave and not a particle. A century later, Einstein ascertained that light is made up of photons which are elementary particles. Since then physicists have been challenged by the quandary of being unable to explain how particles are part of a

wave. Particles are somehow involved with waves, but physicists do not observe them simultaneously. They observe either a wave or a particle, but they are never manifested together.

The wave-particle quandary arises from the original preconception of a wave having a nonparticle involvement. There was an attempt to isolate nonentities (0) from entities (1). This removed the physical (particles) necessary for an involvement with the nonphysical. By not including both the 0 and 1 as an integral part of the wave, nature's binary base necessary for the contrasts to define wave phenomena — or any phenomena — was entirely overlooked. To understand nature is to understand the necessary involvement of both the 0 and the 1. They inextricably depend upon each other for their coexistence-existence. To understand either one (1 or 0) is to have knowledge of both. Whether we understand it or not, this is the frame of reference[1] for all our patterns of observation.

Because of the 0 and 1 dependency, prior attempts to completely exclude physical substances from the wave did not succeed. A necessary physical medium for explaining a wave's propagation is still used by physicists today. Water and air molecules are said to be the physical propagation medium for water and sound waves. When Thomas Young demonstrated that light was wave-like and not particle-like, other physicists invented a wave transmission medium for light: the "ether." It was believed that tangibles (water, air or ether) were a necessary medium for waves to be waving in. When Einstein presented the compelling proof that light contained photon particles, he discarded the necessity of the "ether" by stating that empty space was all that was necessary for the propagation of light. The contrived and unobservable ether was replaced by a simpler explanation.

Once Einstein's work established that light was made up of photons, we could ask, why didn't photons become the medium

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[1] Corollary #2 – The physical and the nonphysical represent the frame of reference for all observations and measurements.

of light waves in the same way that water and air molecules are the medium for water and sound waves? If air particles are the medium for sound waves then why not have light particles be the medium for light waves? Instead of this conclusion, when Einstein said that empty space was all that was needed for photons to propagate in, physicists accepted Einstein's claim and never looked back. With this acceptance they abandoned the necessity of light waves having a physical transmission medium as do water and sound waves. If a transmission medium for water and sound waves had been invented — only to later find out this medium did not exist and these waves were in fact composed of particles of water and air molecules — then what would physicists have done? Would the conclusion have been similar to the one reached for light waves? After discarding the invented medium, would empty space have been accepted as the only medium necessary for the propagation of water and sound waves? This inconsistency between the medium for water and sound waves in contrast to light waves demonstrates the difficulty of reconciling particles with waves. How can light be a wave without the requirement of a tangible medium while water and sound waves appear to have a tangible medium? Light waves become the sole exception in describing the nature of wave phenomena. How can we remove these contradictions and reach a logical consistency? This discrepancy gives evidence of the failure of the original and present description of waves. Can we find conformity in explaining all wave phenomena?

There is an apparent reluctance among physicists to re-examine traditional concepts of waves. The considerable difficulty with wave interpretations suggests an error in the original conception. Let us turn to present interpretations of water and sound waves by closely examining water and air molecules. The energy (motion) of water waves is transferred from one water molecule to another and is perceived by the motion of ascending crests creating the adjoining descending troughs. The filling of a hole above (crests) creates a hole below (troughs). More (1) water above necessitates less (0) water below. Sound also transfers

energy (motion) from one group of air molecules to another. This yields a combining of molecules resulting in their compaction (crest). A compaction (crest) is a *together* phase for air molecules resulting in an *apart* phase of an adjoining rarefaction (trough). A together (1) phase always yields an apart (0) phase and conversely.

A relevant question becomes, what is the energy (motion) of this matter — water and air molecules — using as a medium for its propagation? For any form of matter to have motion (energy) it must be derived from the medium of the nonphysical (empty space).

If physicists accept the generalization that photon particles propagate in empty space, then why not accept the generalization that water and sound particles also use empty space as the medium for their energy propagation? Current wave theory states that water and air molecules are the medium for wave propagation. More clearly stated, however, waves represent water and air molecules' changing use of the medium of empty space for energy propagation. Which is the better description? This now matches the light wave description of photon particles using the medium of space for their energy propagation. A wave exhibits the physical's use of the medium of empty space for all of its motional energy (propagation). A wave is the continual changing relationship of the nonphysical (0) to the physical (1) during the physical's motion. Is the wave a continually shifting geometrical pattern of the 0 as the 1 uses it for motion? Is it an entity's (1) use of the 0 entity that explains the fundamental creation of the wave phenomena of crests (1) and troughs (0)? Are the crests created by particles filling space and the troughs created by particles emptying space? If this explanation is correct, then all physical motion is a wave where the 1 is using the medium of the 0 to reach a positional transfer of its energy (motion) to other objects. In sound and water waves, the energy of emission (motion) is transferred at the point of absorption that results in the filling of crests (1) and the emptying (0) of troughs. The input of energy absorption for an object — water and air molecules — results in the object's

energy output (wave of emission). The absorption input generates a wave with the emission output — energy (motion) of an object — leading to another absorption input to emission output for another object. The wave is continuous in the sense that the wave's motional energy is continuously transferred — through absorption — from one object to another. Each individual object has its energy/mass emission output (wave) reach the positional/mass absorption input (non-wave) of transferring its energy to another absorber. As an object is absorbed by the absorber, its wave of energy collapses with the transfer of energy to the absorber. This explains the oscillation between wave (emission) and nonwave (absorption) for all objects. As the wave (motional energy) ends for the object being absorbed, it continues on for the object absorbing this energy. When calm water reappears it represents water molecules in the empty nonenergy state of having transferred their energy. For calm water there is no energy input necessary to produce the energy output of wave crests with the resulting troughs.

From the beginning, there was a general failure to recognize that a wave exhibits a duality between the 0 and the 1. Instead of the 1 being the medium for the wave, the 0 is the medium for the 1. The wave cannot be separated from particles and the world of matter. The wave is a combination of both the physical and the nonphysical in transporting energy (motion) from one object to another. This corroboration is expressed in the undulation between crests (1) and troughs (0).

To repeat the wave definition from Chapter Six: *A wave is the motion of matter using the field of nothing for its propagation.* In other words, a wave is the energy/mass of emission used to reach the positional/mass of absorption.

This new interpretation eliminates the present confusion, but it does require a fundamental change in thinking. The great mental block to this change in thinking is the indifference or insensitivity to the intrinsic nature of the 0. The inadvertent exclusion of the 0 has created a faulty definition of waves. Instead of inventing a wave with a physical medium and no particles, reality is better

served by a wave with particles (1) using the nothing (0) of empty space as the medium for the particle's emission. The interdependency factor between the 0 and 1 involves both the 0 and 1 for any identification process — corollary #2. A wave is the emission stage where the physical has motion through the use of the medium of nothing. To picture the nature of waves is to see the relationship of particles (any object) with the 0 of nonparticles. A goal of science should be to match physical and nonphysical theory with physical and nonphysical reality.

The problem in making this match has been the inability of integrating a wave into the stage of emission. A wave is the emission stage used in reaching absorption. At absorption, the wave collapses and is reborn through the absorber — the object that absorbed the energy. This transfer through absorption creates a new wave of emission. A wave input (energy input) creates a wave output (energy output).

The attempt in physics to force upon motion and position a simultaneous occurrence is the primary source of the inability to see these dual stages of nature. Recording is an absorption process reached through the wave (emission). Emissions (waves) are not a direct part of human experience. Motion (wave) can be understood but it is indirectly perceived through the direct recording of absorption (for example, looking)[2]. To look is to record with absorption. The use of our sensory perception is an arrival at positional absorption. The continuous out-of-position process of motion (wave) has ceased for the object absorbed. A wave is only indirectly perceived through the direct perception of a rapid series of positional events of particle absorption. This presents a reason for our difficulty in perceiving waves and particles together. We can only perceive a particle and not its motion (wave). When particles are absorbed this ends the emissional wave process. A wave (a particle's use of 0 medium) leads to an absorption event.

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[2] For a discussion of motion as an indirect observation for humans, see Chapter 5.

Human observation (absorption) requires a termination of the wave.

A wave is the physical's use of the medium (field) of nothing to arrive at any position. For example the wave moves things (1) to the 0's of the mind through the 0's of our measuring devices. A wave is the 1's use of the 0's medium to reach a particular location.

Because of water's resistance to being compressed, a water wave transfers its energy of motion in an up-and-down transverse fashion. Where a water wave cannot go forms a path to where it can go: filling the space above. Instead of the same water moving along with the wave, the energy of motion is transferred from one section of water to another. The apparent movement of a crest is the flow of energy (motion) from one set of water molecules to another. Water waves move largely up and down. The direction of the wave's transfer of motion from one water molecule to another is forward.

Because air molecules can be compressed, their motion is longitudinal, or in the same direction as propagation. In both sound and water waves, it is energy (motion of matter) being transferred from one object to another — emission to reach absorption (point of energy transfer) and a new emission.

If crests are the physical part of the wave (water and air molecules), then what are troughs? When water fills (1) the space above with a crest, it creates an emptying (0) process below: the trough. Again there is this dependency factor behind all universal action. To have a crest (1) and a fill, there must also be a trough (0) and an empty. A wave is an effect of the binary world.

The wavelength represents the size of the 0 that is involved in the 1's propagation. Motion for a single particle is a continuous cycle of filling (crest) forward and emptying (trough) behind. This continuous nature of the wave is in opposition to the wave's collapse when the object of the wave is absorbed. With its collapse of motion (wave), the single particle is no longer isolated and is absorbed by another structure. The wave (motional/energy) is dis-

continued for the object being absorbed and continues for the object doing the absorbing.

Why a wave encompasses a wide and large area while a particle is more finite and point-like has always been a mystery. The mystery is easily solved by including both the particle (1) and the medium (0) it is using for propagation (emission) to reach position (absorption). The focus of our thinking has been on tangible objects without regard to the intangible field (0) necessary for the objects' propagation and identification. When one looks at a finite local object, it is defined by the borders of the infinite nonlocal nothing next to it. To look at particles is to eliminate the emissional wave because looking is absorption where particles become stationary in the mind. The recording processes of the mind create a stationary field (0) around the observed object. This is not, however, the object's motion (wave) with its continuous changing field (0). The recording event of the mind differs from what an object in motion is doing. Humans can only determine waves (motion) in an indirect manner by a rapid series of mental positional images. This is a rapid sequence of nonmotion for the particles involved. Motion for humans is indirectly determined by a series of pictures without motion.

The concepts of *matter* and *field* are used extensively in science. To improve our understanding of these it is necessary to label the field with the 0. It is the 0 of the field that attracts matter (1) and induces its emission and absorption processes. The physical framework of an object can move its organized 0 to another 1 and a 1 can move to the 0, or they can move toward each other. Upon arrival, the attraction force reaches fruition. The wave with its changing spatial dimensions ceases. The 1 has entered the parameters of a specific 0. The use of a 0 pathway has been concluded through absorption. The 0's continuous dimensional changes cease upon arrival and become discontinuous (stationary).

The problem of interpreting the wave is linked to the problem of the counting board. Since the invention of the symbol 0 for the empty column the role of the 0 in nature remains obscure. The

physical's companion of the nonphysical has gone largely unnoticed. To understand reality, our looking and seeing must include and focus upon both the physical and the nonphysical.

FREQUENCY

In present explanations of wave phenomena, frequency is defined by the number of crests per second passing a specific point. The specific point (a set location) is a position created to record crests upon arrival. The recording of crests can occur only for those crests that are part of absorption. The act of recording must be part of crest absorption. Frequency should be a measurement involving the oscillation between the *emissional/wave* reaching the recording event of *positional/absorption*. Frequency indicates events and events cannot take place without both emission and absorption. All human acquisition of knowledge — and frequency is part of knowledge — requires positional/absorption reached through the emissional/wave. First the recorder has positional/absorption and then we use the emissional/wave to bring positional/absorption to the mind's recorder. There is no frequency involved with waves that are not part of the recording device.

The crests are identified and recorded because of the troughs of no crests in between. This involves earlier discussions regarding the *frame of reference* allowing observation.[3] Sensitivity is derived from a prior lack of sensitivity. The *on* part of the switch cannot exist without the *off* part. The recording of the crest is the *on* (1) of arrival and in between arrivals is the *off* (0) of the trough. The departure of a crest with the emergence of the trough must occur before another arrival of another crest and conversely.

The frequency involved with recording crests should not be confused with what actually happens during a wave and its isolation. This isolation is not involved with frequency. Frequency is a statement of arrival and departure cycles. The wave is only a part

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[3] Corollary #2 – The physical and nonphysical represent the frame of reference for all observations and measurements.

of departure and in isolation has nothing to do with frequency. The crest cannot be recorded without the crest's positional arrival through the wave of emission (departure). Actual frequency should refer to the number of times per second an object absorbs and emits — in this case how often the recorder absorbs and emits. Frequency involves the *on* process of recording crests defined by the in-between *off* of nonrecording. To state the frequency of a wave is to describe the rate at which an object would absorb and emit through the wave's cessation at arrival (absorption) and the wave's beginning at departure (emission). Frequency measures the contrasts of the changing nature of the 0 and 1 that occur through emitting and absorbing. These changes involve a relationship between two or more objects that are part of absorption and emission. Frequency is the relationship between the object that absorbs and emits and the object being absorbed and emitted. Frequency and its knowledge are unattainable without both stages. The wave of emission is necessary for reaching any absorption and any knowledge.

Wave frequency should represent the rate of emission (wave) between absorptions. *Positional frequency* should represent the rate of absorption between emissions (wave). Frequency is a part of both the wave frequency of emission and the positional frequency of absorption. The prime aim of this discussion is to show that whenever the concept of frequency is used it involves both the stage of position (absorption) and the wave stage of motion (emission). The term wave frequency is incomplete because it implies the emissional wave process without including the positional absorption process. Wave frequency should indicate the rate of emissions between absorptions. If the phrase *wave frequency* is used its applications should be with the oscillating process of the emissional/wave and positional/absorption.

The process of "filling" and "emptying" during the wave is not the same as the final process of the completion of an empty and a fill for objects. The fill and empty during motion is an object's continuous creation of the disappearing 0 forward and the reappearance of the 0 behind. The motional wave is used to complete

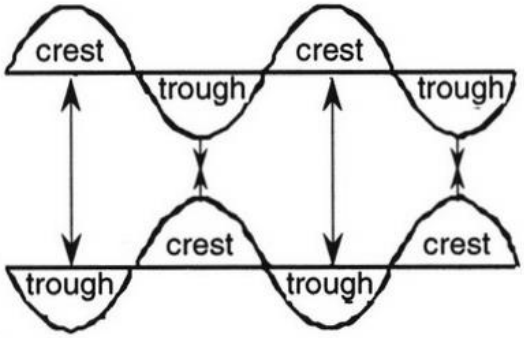
the process of the stationary matter state of the fill and the antimatter state of the empty. The continuous "filling" forward and "emptying" behind by an object during motion is discontinued with the cessation of the motion necessary to arrive in the hole. A fill also completes the emitting phase with the complete emergence of the empty condition. Emptying indicates the emissional/wave and an expansion process. Empty indicates the 0 condition of the object that emits. Fill indicates the 1 condition of the object that absorbs. Filling is during motion and indicates a contraction process toward the positional/absorption of the fill of entering the 0. Filling is the forward contractual motion toward the goal of a fill. When positional/absorption is reached there is now the possibility of a defining process for the geometry of both the 0 and the 1 because they become stationary relative to each other.

Again, the emphasis is that "nonmotion" is not to be considered absolute, but one where the parameters of the hole of arrival are not moved out of. To sit in a chair is to arrive in a specific location defined by the chair's organized space. The body may move in the chair by crossing an arm or leg, but the body is still in a specific location and "stationary" within the boundaries of the chair's hole. In this example nonmotion means that there is no decision by the occupant to move out of the specific geometrical space defined by the chair. Nonmotion means that motion to enter a specific hole, defined by its physical borders, has been completed. "Nonmotion" in this treatise means nonmovement outside the hole of arrival. Motion and nonmotion follow one after the other from one hole after the other. It is the entering and leaving of 0s that allow the opposites of motion and nonmotion to exist. As always, the existence of both is necessary for the contrast allowing their definitions.

DESTRUCTIVE INTERFERENCE

In this discussion it is important to refer to the accompanying diagrams. For hundreds of years it has been taught that when waves come together where the troughs of one wave fit into the crests of another, there is an interference causing a canceling or a

Diagram #1



To the left is how we are taught to think about water waves and destructive interference. If crests fit into troughs, then calm water will result.

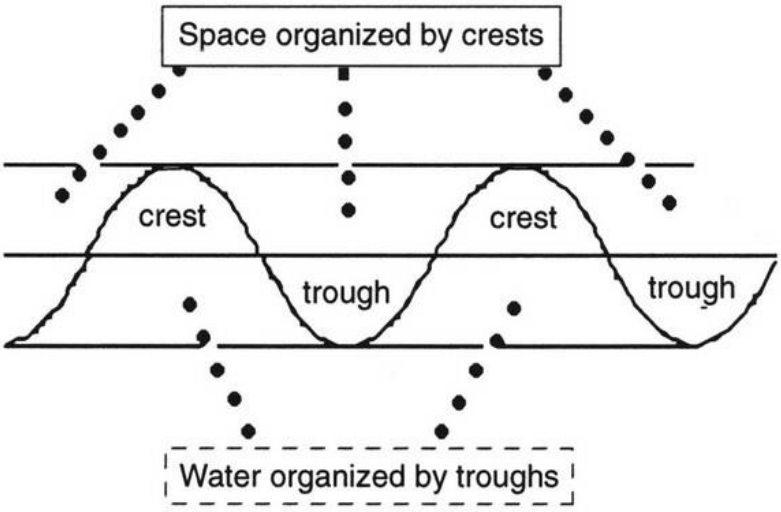
$= \frac{\quad}{\text{calm water}}$

destruction of the wave. Diagram #1 illustrates this with respect to the coming together of two water waves. The diagram appears to show correctly that when the crests of one wave fit into the troughs of another wave, the effect is calm water. When two sound waves come together where the compactions (crests) of air molecules of both sound waves fit into the rarefactions (troughs) of both waves, it is interpreted to be a "destruction of sound" with silence as the effect. Present interpretations also state that when the crests of light waves enter the troughs of light waves, there is also a wave destruction with darkness as the effect. This is standard textbook instruction.

Let us discuss this interpretation by first examining water waves and begin with this question: Is the relationship between crests and troughs enough to describe wave geometry and a wave's involvement with other waves? To answer this, let us inspect a water wave, or any wave, through the complete use of the 0 and 1 frame of reference necessary for all observational definitions. The common term "water waves" focuses on the physical but to understand wave phenomena we must concentrate on both the physical and nonphysical parts of the wave. The 1 of water and the 0 of nothing describes and identifies all of the wave. The 1 of water is identified by the 0 of nonwater and conversely.

Using diagram #2, what part of the water (1) identifies and provides dimensions for the trough (0)? The water below the crests provides the dimensional borders for the troughs' geometry,

Diagram #2

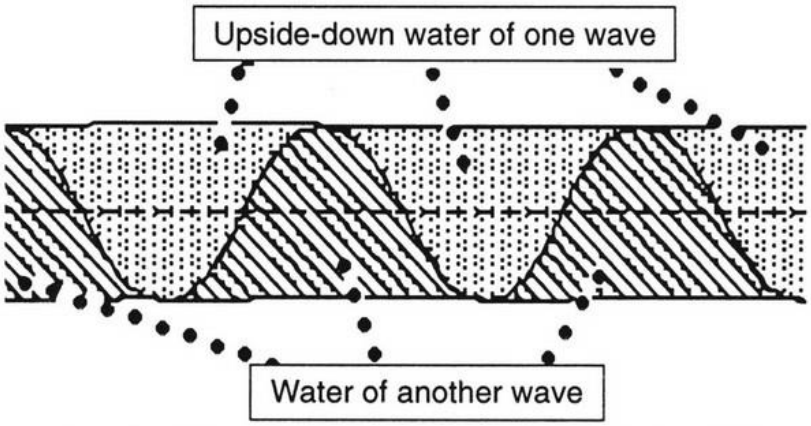


Is there more to a wave than crests and troughs? The trough is organized and identified by the water on either side. This water is also organized and identified by the troughs on either side. 0s of troughs and 1s of water are necessary for each other. The crests of water are also organized and identified by the space above the trough, and likewise this space is given its boundaries by crests. 1s of crests and 0s of space above troughs are necessary for each other.

Is it important to include the water below crests that gives a border and geometry to troughs as part of a wave and is it important to include space above troughs as part of a wave in that it gives borders and geometry to the crests? If these areas are not part of a wave, then why do they involve a sailing vessel when falling from the top of a crest to the bottom of a trough?

identity and existence. What part of the wave provides the crest its geometry, identity and existence? It is the space above the trough and between crests that provides borders for a crest's existence and identity. There is much more to a water wave than crests and troughs. A comprehensive conception of water waves must include all of the somethings (1) and nothings (0) composing the waves. It may be said by some that these areas are not important when discussing a wave and interference. However, they are important and they are an essential part of the wave. An example is a sailing vessel's involvement with a wave from the top of a crest to the bottom of a trough. A craft's motion uses the spatial (0) area above the trough and the spatial area of the trough. These areas are organized and identified by the crest and the water below the crest. The craft's attraction for and use of this space is guided by the 1 of water (crest and water below crest) that is repulsed by the craft's 1. This additional water (water

Diagram #3



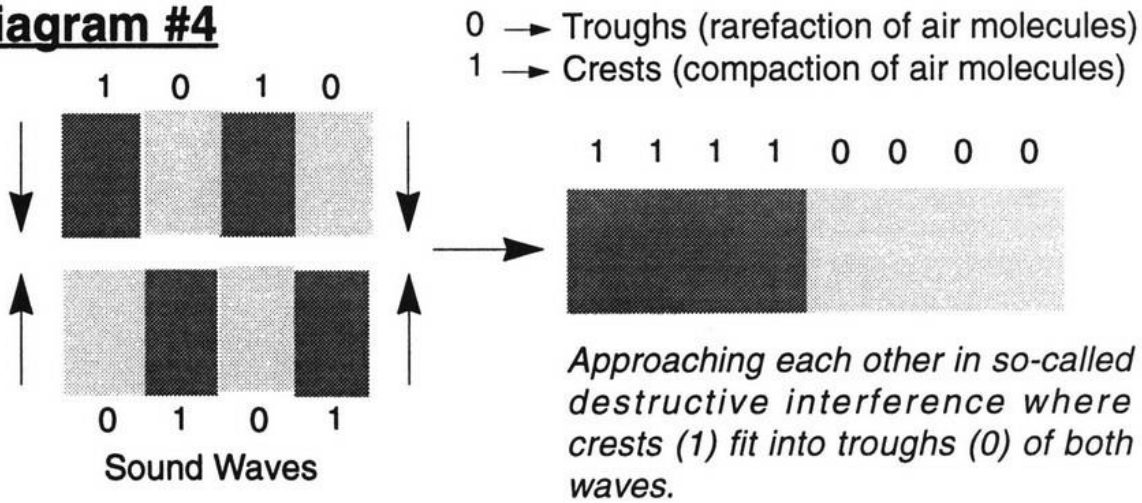
We have now used and included two water waves. One wave is turned upside down only to illustrate how all the water that is part of both waves will fit into and displace (fill) all the space that is part of both waves.

Look at the difference when we include all the water that is part of both waves. Instead of calm water, we have a crest that involves all the crests of both waves and water below the crests. The picture is not complete because nearby should be space to match not just crests but all the water involved. (See Diagram #5). A larger fill will create a larger empty. In this example there is no destruction. There is only a redistribution of 1s (water) and 0s that cannot be destroyed (Corollary #7).

below the crest) and additional space (space above the trough and between the crests) are essential for completing a wave's identity and determining interference patterns.

In Diagram #3, all the 0s and 1s of the two water waves are used when coming together in so-called destructive interference. There is no wave limitation by involving only crests and troughs as in Diagram #1. One wave is turned upside down to illustrate how the water of both waves completely fills and displaces all the space in both waves. A new picture of interference now emerges with a much larger crest. But this picture is incomplete because whenever the water of one wave fills a hole (trough and space above the trough) provided by another wave, a hole matching the water's space displacement must appear alongside. The physical water and nonphysical part of nature's waves are always conserved (corollary #7). Diagram #5 completes the picture with the conservation of space (trough and space above the trough) adjacent to this larger concentration of water (crests and water below

Diagram #4



Approaching each other in so-called destructive interference where crests (1) fit into troughs (0) of both waves.

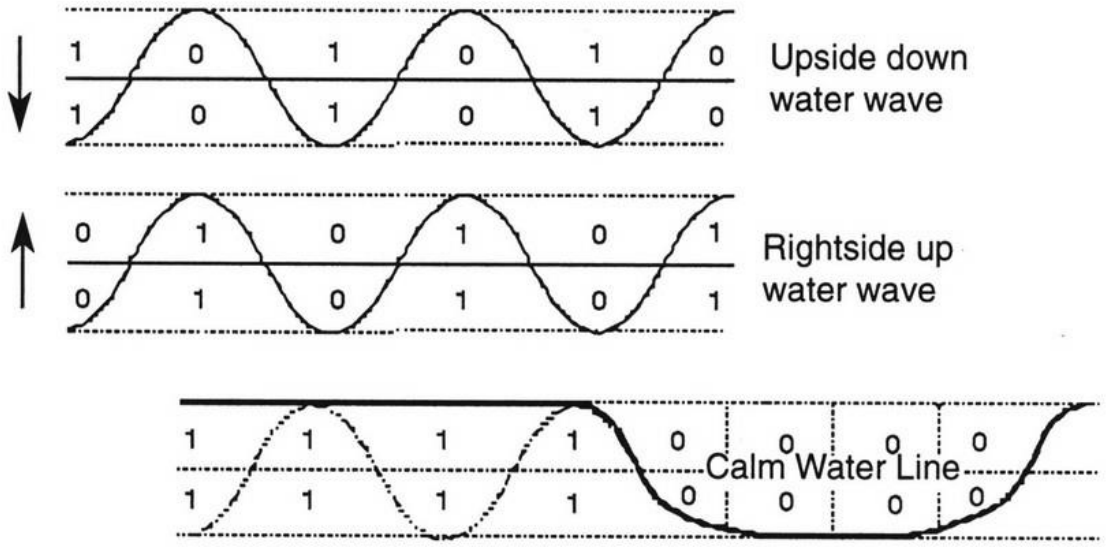
Instead of destruction there is a reconstruction with greater areas of compaction (1) and greater areas of rarefaction (0). 1s and 0s are conserved. In 3 dimensions the 0s will be somewhere alongside the 1s. The 0s of troughs do not disappear when displaced by the 1s of crests. The waves representing 1s and 0s are reconstructed (rearranged) instead of destroyed.

Silence occurs when rarefaction and compaction do not oscillate between certain frequencies. Periods of silence can occur during larger areas of compaction and larger areas of rarefaction. The alternating difference between 0s and 1s at a specific frequency range is necessary for sound's detection. All human awareness comes from specific oscillations involving something (1) and nothing (0).

the crests). The space and water essential to the wave are greater than crests and troughs. The space (0) that gives shape and identity to the crest (1) and the water that gives shape and identity to the trough are of necessity involved in so called destructive interference. Instead of interference causing wave "destruction" there is a rearrangement of 0s and 1s that make up the wave. Both water (1) and its medium (0) of motion are continually redistributed as the wave's motional energy is transferred. The problems of wave interpretation are directly related to the incomplete identification of a wave in the first place. Reality remains a part of both the 0 and the 1.

In diagram #4, the water wave illustration is applied to sound waves. When the crests of compaction displace the troughs of rarefaction from two waves, there is a convergence of crests. This

Diagram #5



0 = space (trough and space above)
1 = water (crest and water below)

Diagram #5 shows two waves with 0 and 1 coming together in so-called destruction. Instead, 1s come together which necessitates a conservation of the adjacent 0s next door — quite different from calm water. Sound waves also come together without destruction (see Diagram #4). As in water, there is a rearrangement of 1s and 0s and a change of the shape of the wave.

In the three-dimensional view, the above diagram will be more complex. The diagram shows the principle of the conservation of 0s and 1s. To reach a greater togetherness of something (1) is to reach a greater togetherness of nothing (0).

In the identification of natural phenomena it is necessary to determine the 0 that is part of all physical (1) interactions.

concentration of compaction (1) also produces a greater convergence of an adjacent rarefaction (0 trough). Instead of wave destruction there is a change in the size, shape and distribution of both the crests of compaction (air molecules) and the trough of the adjacent nothing (rarefaction). An actual three-dimensional picture of the wave's redistribution of 0s and 1s — instead of wave destruction — is more complex than two-dimensional diagrams can show.

Current thinking would cancel the energy of the wave during destructive interference with its sudden reappearance elsewhere. What happens in a thought experiment where all the crests and troughs in a single body of water come together destructively and simultaneously? Current theory predicts the body of water would revert to a sudden calm state. A crucial question arises, what happened to all the energy? A surface of energy (motion) suddenly disappears. How can energy abruptly depart from a total body of water when water energy transfers occur from one water molecule to another? Energy spreads outward until the water's energy output from energy input is finally completed. Dissipation of the water's energy output must have a structure available for absorbing (input of energy) this energy. The calm water indicates that its surface is in a nonenergy state. The water molecules can no longer be involved in this output and input oscillation of energy. Where are the structures required for absorbing this sudden energy removal from the combined total energy occurring at the water's surface? I do not believe energy is abruptly removed by "destructive interference." If by chance a total so-called destructive interference occurred, the result would be a redistribution of surface energy, that is, a redistribution of 0s and 1s with larger areas of crests (1) and larger areas of troughs (0). The energy (motion) of water at the surface does dissipate by energy's redistribution over a larger area of water, but to conclude that energy can be immediately removed with a sudden transfer to unknown sources is impossible. The same thought experiment with sound waves would result in the same impossible results. If a large area of compaction and rarefaction of air molecules arrives simultaneously as in "destructive interference," the energy is not destroyed, but instead becomes more concentrated with larger areas of compaction (crests) and larger concentrated areas of rarefaction (troughs). The concept of wave interference and destruction should be changed to wave interference generating a redistribution of energy in using the 0 medium for its propagation. Instead of "wave destruction" it is *wave reconstruction.*

DOUBLE- AND-SINGLE-SLIT EXPERIMENTS WITH LIGHT

Thomas Young's double-slit experiments with light appeared to give convincing evidence that light was not made up of particles, but was in fact a wave. If a light source goes through a single small slit it will emerge from the slit and spread (diffract) out onto a target screen in a single array of light. But when two slits are used, the light's emerging diffraction from each slit is said to interfere with the light from the other, causing alternating light and dark lines on the target screen. This is said to show the wave characteristics of light. The light lines are said to show constructive interference where crests match crests and troughs match troughs from the waves of both slits. The light lines are interpreted to be a reinforcement of a wave's crests and troughs and therefore a reinforcement of light. The dark lines are said to be a result of destructive interference where crests of one wave fit into troughs of the other causing darkness by a cancellation (destruction) of waves from both slits.

These alternating light and dark areas from the double-slit experiment excited me to the realization that this was another verification of the dual nature of our binary 0-and-1 universe. It seemed obvious that the double-slit experiment was a demonstration of areas of light concentration from objects called photons (1) with the in-between areas of darkness and no photons (0). This coincided with the alternating 1 and 0 patterns observed throughout nature. It was a major verification for a wave being a composite of the changing oscillating patterns of both the 0 and 1.

In shining a light through a single slit, it produces a single area of light on the target screen. This single area of light also demonstrates the necessary frame of reference of the 0 and 1 for all observations. The light area is the arrival of photons (1) which is identified by the darkness (0) that surrounds this light. The double slit's difference is only that the 1 of photons alternates with the 0 of no photons. All defining processes involve both 0 and 1.

Darkness in the single-slit experiment and darkness between light lines in the double-slit experiment both represent the 0. But present explanations of "destructive interference" have the 0 (darkness) in single and double-slit experiments caused by different explanations. Darkness in the single-slit experiment is from light particles not diffracting far enough to take these paths (0) to the target. The darkness of single-slit means the pathway from the slit to the 0 of the target screen never had the availability of a light particle. In the double-slit experiment there is the availability of light particles from both slits, but destructive interference (crests meet troughs) is said to cancel the light and produce the darkness between light lines. Somehow the photons of the canceled light wave reappear in the light lines. The light lines are said to be caused by constructive interference where crests and troughs of waves from each slit match and reinforce each other. Now we have two different explanations for dark and light lines from both single and double-slits. The darkness of the single-slit occurs because light particles were never available for this path to the target. Darkness of the double-slit is said to occur because of the destruction of light waves which somehow cancel light particles. The light displayed by the single-slit is due to light particles following uninterrupted pathways in arriving at the target screen. But the double-slit requires the alternating light areas to result from a constructive interference of light waves. It appears that the dark and light patterns at the single (central array of light surrounded by dark) and double (alternating dark and light) slit targets are formed by two entirely different explanations.

What about dark areas above, below and outside of the dark lines of the double-slit pattern? These areas would be similar to the darkness of the single-slit experiment where light particles did not diffract enough to arrive at the target. Does this mean we have darkness (0) for two entirely different reasons in different places on the same screen? The light at single and double-slit are also required to occur for different reasons.

Is this the nature of light? Does this inconsistency for darkness match the way nature is usually revealed? Let us answer this by

representing a light wave as photons (1) and the 0 medium (field) the photon uses as a pathway to the target. If light particles and the 0 medium that represent the wave, are conserved, then the wave cannot be destroyed (corollary #7). But it is possible to rearrange the pathways (0) that the light particles are using and not using for their motion toward the target. Waves can change their 1 and 0 relationships and still be conserved.

If the 0 is part of the wave and is accepted to be the medium and necessary partner for light propagation, then the 0 must be conserved as well as the light particles. But present quantum interpretation does not identify the 0 as part of the wave and no attempt is made to determine the 0 involvement from the light source to the target. If the target is a photographic plate, then the expected central area of light from a single slit comes from the arrival of photons within the chemical 0s at the target. There is emission of light from a single slit using uninterrupted pathways (0) toward the screen. Upon arrival, light particles are absorbed collapsing the wave. The motional/wave of a particle and its changing field (0) of propagation cease. The light particle has entered the hole of the photosensitive chemicals. This arrival shows the single array of light from the single slit, demonstrating the evenly used pathways leading to a complete and compact use of holes at the center of the target. Darkness (0) does not show where light (1) is absorbed because pathways to the holes of the target were used. The darkness surrounding this single array of light is demonstrating the empty 0s at the target because pathways leading to these holes were not used. By including the 0 as an integral part of the wave, there is more available information leading to a clearer explanation of wave phenomena.

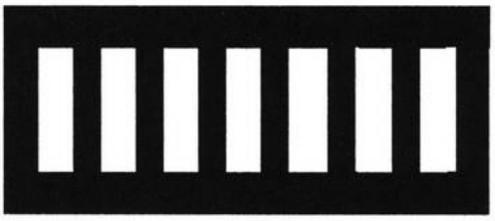
Let us transfer the single-slit use and nonuse of the 0 to reach an alternate description of the double-slit experiment. The proposal is that the alternating dark lines of the double-slit pattern are empty holes occurring because light particles were induced to use alternate pathways to the target. Photon propagation from the source to the target represents changes in the photons' use and nonuse of pathways (0). The even distribution of pathways for

light particles of the single-slit experiment does not occur in the double-slit experiment. It appears that diffraction from both slits causes light to merge in using the 0 pathways for their propagation. Is this merging of two diffracting light sources causing light particles to converge in a more compacted use of their pathways? If this happens, then the compacted use of pathways produces the light bands of the double-slit pattern. The *principle of more and less* can now be used to show these alternating dark and light patterns. The more compacted use of holes by light particles during propagation creates a less compacted use of adjoining holes. Is this similar to excess (1) and deficit (0)? An excess of 1s will of necessity produce an adjoining deficit of 1s. A deficit of 1s (photons) is equivalent to an excess of 0s. Is it logical that a compaction (1) of photons will of necessity create an adjoining rarefaction (0)? If more photons are squeezed together in one area, then the rules of nature require there to be an adjoining apart phase. Does the merging diffraction from both slits induce photons to use more pathways in one area causing a greater concentration of particles at the alternating light bands (lines)? Does this also result in the less used pathways alongside resulting in the dark bands? By including the 0 as a partner to the 1 of photons, there is another alternative on how to view this phenomenon. It is reasonable to assume that pathways would be changed when photons use two slits instead of one. It is simply redistribution of the use of pathways. This redistribution causes a rearrangement of 1s (photons) resulting in a rearrangement of 0s (no photons) . With this explanation, dark and light from both double and single-slits can now occur for the same reason. Instead of "destructive interference," the 0s and 1s of the wave represent a reconstruction of pathway use and nonuse by photons. The light lines of the double-slit pattern are the photon's use of the field of nothing for its propagation to the target. The dark lines of the double-slit pattern are the photon's nonuse of the field of nothing. From a single-slit to a double-slit, the field (0) is different for the photon's propagation, causing a change in the photon's use of the field.

This light and dark pattern is a superb declaration of this oscillating and changing binary (0 and 1) universe.

To comprehend this explanation of wave phenomena, the relationship between crests (1) and troughs (0) must be understood. Nowhere in present sound theory is the concept of *nothing* included as an integral part of sound. Scientists allude to the physical alone by saying that crests and troughs are a compaction and rarefaction of air molecules. This same problem is involved with other types of waves. The function of *nothing* is never stated. But as always there is a compaction and rarefaction of nothing (0). Today attention is directed to the "presence and absence of the physical" without including the "presence and absence of the nonphysical." There is no explanation given for the function of the 0. This has led directly to a misunderstanding of the nature of waves.

Diagram #6



0 1 0 1 0 1 0 1 0 1 0 1 0 1 0

The double-slit pattern of light interference.

1 = light bars (something of photon)

0 = dark bars (nothing)

The difficulty of interpreting waves is increased by limiting a wave to crests and troughs. The failure to identify all the 0s and 1s as a part of the wave has been a central error of wave interpretation. In diagram three, instead of destructive interference of water waves, there is a rearrangement of the wave with larger areas of water (1) that involve crests and water below the crests. Diagram five has included the space (0) of troughs and space above troughs. All this space is necessary to give definition to water crests and to the water below the crests. Is it possible that this incomplete description of water waves has led to an incomplete description of light waves? Has this led to an erroneous wave interpretation of the double-slit pattern as well as light waves, or

how any waves are viewed in general? Is the double-slit pattern merely a rearrangement pattern of 0s and 1s that are involved in all natural phenomena?

What about waves and *constructive interference* with waves? Constructive interference is limited to waves coming together with the crest of one wave coinciding and reinforcing the crest of another wave. And simultaneously the trough of one wave is coinciding and reinforcing the trough of another wave. Would our view of constructive wave interference change if all the 1s and 0s of a water wave were included? More 1s and 0s exist by including the geometry and organization of water below the crests and space above the troughs. Why not include this enlarged model of a wave and return to the drawing board?

Instead of wave *destruction* there are new forms of *construction*. It does not matter how waves come together. The 1s and 0s that make up the wave are rearranged into a new pattern for the 1s' emission toward the goal of absorption.

When photons come together with diffraction in the double-slit experiment, are they forced closer together during the use of their pathways? Does this together (1) phase create an adjacent apart (0) phase? Do photons have a greater unity that necessitates a greater unity of the nonphysical (no photons) adjacent to them? This description is a better approximation of reality because it matches the cause and effect derived from other observations and it is simpler.

The double-slit experiment has revealed one of the great problems in the attempt to interpret nature. The problem is further compounded by the alternating light and dark patterns of interference emerging at the screen when it appears there is nothing to cause such interference. If one particle at a time is sent toward the two open slits, the double-slit pattern still emerges on the screen raising the question: how can a single particle interfere with itself? However, if a recording device is placed in each slit to determine which slit the particle goes through, the single slit pattern emerges on the screen opposite each slit. This bizarre anomaly has been a part of physics for so long, some believe it can never be

explained. What is there about the two *slits* in the double-slit experiment that changes a single particle's pathway to the screen as it emerges from one of the slits? With one slit, a particle has a different path because only one slit is available to it. This introduces the possibility that in the double-slit experiment, a single particle may be "aware" of the 0s of both slits as it approaches and uses the paths that form the double-slit pattern. The field (0) of two slits guides the particle along a different path than in the field (0) of one slit. When a recorder is placed at both slits, does a recording of the photon cause the photon's two-hole (double-slit) response to the target to change to a one-hole (single-slit) response to the target? Does a single photon predetermine its pathway because of its guiding field (0) and respond accordingly without the necessity of diffractive interference? Objects are continually "aware" of their fields (0) during propagation. The field (0) of two slits is obviously different than the field (0) of one slit. The two slits are joined together by the 0 field that identifies both slits. As the photon approaches both slits, it is the physical borders of the slits that organize the geometry of the photon's 0 field. The photon is "aware" of its field's shape and responds accordingly for its direction of motion. When the photon is recorded at one of the slits, its field (0) information changes and responds as if there were only one slit.

Humans are guided and directed by the organized pathways and holes around them. If more holes are available, does this affect a human's choice of motion? Does a greater choice of holes influence our pathway upon emerging from the hole of choice? A human can change his direction of motion to follow his changing judgment. Humans are also guided to directional decisions by the field (0) that is in front of them. Does the single photon reach a different "decision" of its future path when approaching two holes instead of one? Are particles as well as humans "aware" of the organized 0s they use for propagation and do they react differently when confronted with a difference? Are objects other than humans capable of reacting differently when confronted with different combinations of 0s? As the photon (1) begins its propaga-

tion from the light source it may be "aware" in advance of its directional "decision" after emerging from one of the slits. This is because its 0 pathway is part of the 0 involved with both slits. To negate the possibility of particle "awareness" is to believe that only humans can be cognizant of the configuration of the 0 field in determining a course of motion. Is it possible a particle can also predetermine its course of motion because of its sensitivity to the geometry of the nonlocal 0 medium it is intimately involved with?

A solution to the double-slit problem can be reached by explaining the wave as an oscillating transition between the 0 and 1 as the 1 uses the 0 as its medium of propagation. The 0 pathway is the guide for the particle in its emission stage. The wave is only one part of a two-part system. Absorption and the end of the wave is the other part. The wave (emission) is the part used for the journey along the path to the arrival (absorption) part. The journey (motion) of other objects is never a direct part of human observation. The observer of necessity always collapses motion (collapses the wave).

In the General Theory of Relativity, Einstein clearly shows that the gravitational field is empty space that is shaped and defined by the gravitational mass of the bodies involved. Here again, there is the 1 of something (gravitational mass) and the 0 of nothing (gravitational field) representing the fundamental entities for explaining gravity. The 1 of gravitational mass is "aware" of the 0 gravitational field when it expands (increase of distance) or contracts (decrease of distance). The 1 responds accordingly by an increase or decrease in the attraction force. This is an example of how the mass of physical bodies can be influenced by the changing area of the 0. This shows the possibility of an object's sensitivity and different reactions to changing fields of space. To change from one slit to two slits represents a changing field (0) for the particle involved.

The principle of the binary 1 and its 0 field can be extended to explain all natural phenomena. To place the 0 into the model of a

field is the key to understanding waves. The field of nothing directs the motion of all objects.

The difficulty in viewing the wave begins with the initial perception of a separation of particles from waves. Physicists must set aside the question of how a particle can be in a wave? The solution is to remove this separateness by uniting the particle (1) and the medium field (0) that the particle uses for propagation and occupation. The correct perception brings the 0 and 1 together in one unified concept. Their mutual dependency requires this togetherness. The existence of one depends upon the other. Any approach to the reality of nature uses as its basis of interpretation both 0s and 1s. A wave cannot exist as only a 1 or only a 0. All waves require this binary foundation as does every phenomenon of nature.

Theoretical physicist David Bohm modified Schrödinger's wave function by attaching a real electron to a wave. This wave has been named a *pilot wave* because it pilots or guides the electron in its motion. Bohm's modification incorporated both a wave and a real particle into a unified explanation of each. A real particle is involved with a wave instead of Schrödinger's wave function interpretations that require "ghost particles" to exist everywhere and nowhere.[4]

Bohm's mathematical model brought reality back to quantum theory which could then be explained with real objects (electrons). Nevertheless, there appeared to be no way to explain the pilot wave. The pilot wave reveals its existence indirectly by how it influences the electron. Necessarily, the pilot wave connects to the electron because it shepherds its motion. Because the pilot wave is said to be invisible, physicists are perplexed by how something invisible can guide an object. The pilot wave is required to instantly change its shape whenever physical changes occur elsewhere. This invisible wave somehow communicates its changing shape to the electron causing it to alter its motion.

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[4] See Chapter 6.

Bohm refers to this invisible guiding force of the pilot wave as a "hidden variable." Bohm named the guiding force of this hidden variable the *quantum potential.* The quantum potential provides the electron with the "awareness" necessary for its motional "decisions." The challenge of the *hidden variable* theory is to expose this hidden variable. Bohm claims there is something other than local physical concepts that have escaped attention. It is postulated that the hidden variable involves nonlocal aspects as opposed to local finite physical objects. The concepts of *local* and *nonlocal* match the necessary opposite concepts for any defining process — corollary #9.[5] It is said the electron is somehow attached to this hidden variable because it provides the electron with the information necessary for its propagation.

At this point, the reader may have some clues on how to explain Bohm's modification of the wave function. The hidden variable theory is an important corroboration of the principles introduced in this treatise. The challenge to every interested observer is to reveal the hidden variable. What has Bohm done? He has introduced a guiding wave and then connects it to a real particle: an electron. Bohm's invisible pilot wave is actually the 0 of the invisible nothing that has always been necessary for the directional motion of the physical world. The hidden variable is the 0 field. As discussed in prior chapters, the 0 provides the guiding path for the emission (motion) of not only electrons, but for the physical part of all structures. Whenever there is a physical change, it instantly changes the nonphysical because the physical provides the geometrical borders for the nonphysical's shape and form. The geometry of both the 0 and 1 are mutually dependent. A change in the 1 instantly changes the shape and form of the invisible hole defined by the 1. The changes of the 0 pathway give information to the 1 for its motion. The electron (1) immediately "determines" the 0 of where it can go (attraction force)

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[5] Corollary #9 – Opposites define each other and cannot stand alone: to know one is to know the other.

because of the 1 of where it cannot go (repulsion force). The 0 is the new field introduced by Bohm as a pilot wave. The hidden variable is used for all physical action. It seems remarkable that the 0's function is still hidden when the physical's use of it is so open.

A problem for physicists is that in order for the pilot wave model to work the changes in the pilot wave require instantaneous recognition by the electron. Informing the electron must be instantaneous and would seem to necessitate a faster-than-light message transmission which is forbidden by Einstein's Special Theory of Relativity. However, Bohm's model — via Schrödinger — is involved only with the emission stage and not the information (message) stage of absorption. The wave of emission is part of the particle's involvement with its connection to and awareness of the field (0) for its propagation. The wave instead of being involved with messages and information is moving in its 0 pathway toward an involvement with a physical message. The mathematics has isolated emission from absorption. However, emission (wave) indirectly involves absorption because the electron's motion is due to an attraction force (1-to-0 and 0-to-1) driving it toward absorption — the physical message.

Bohm's modification of Schrödinger's wave function is involved with the electron's recognition and use of the 0 field for its propagation. The electron propagates in isolation, but information for the electron's emission and awareness of the pilot wave's changing nonphysical shape must begin with absorption. Prior to the electron's motional wave of isolation, the electron has absorption within the starting place at the area of preparation. Before a wave, there is always the beginning stage of absorption (information). This absorption provides information (message) for an object's determination of where it cannot go. The beginning message of where the electron cannot go gives awareness to the electron of the borders for the pathway (0) it already has connection with. The electron initially receives the message of the repulsion force (1-on-1 and 0-on-0) which gives the electron (1) an "awareness" of the attraction force (1-to-0) of its guiding field (0). The

electron's (1) awareness of the 0 field of where it can go is reached by its beginning message (absorption) of the 1 of where it cannot go.

Physicists translate information of the region of preparation and the region of measurement into the mathematical equations prior to the wave function (emission).[6] This is a prior and necessary message for the electron in beginning its motion in isolation. During its motion, it is unnecessary for the electron to have an additional message because the beginning mathematical message is all that is necessary for its "awareness" of the changing shape and form of its guiding nonphysical (pilot wave). There is always the arrival message of physical absorption before the nonmessage awareness of the nonphysical pathway becomes known.

During the wave, a message is not necessary because it was already provided at the area of preparation. This information allows the wave to give us probabilities of the possibilities of position at the next absorption event during measurement. Messages only occur at the area of preparation and measurement. The wave is the electron at the nonmessage stage of nonphysical (pilot wave) recognition. This is a mathematical development. When humans react to their environment, there is a constant interplay between the message (absorption) of physical awareness giving them a nonphysical awareness of their path of emission (wave). However, objects involved in the mathematics of the wave function receive this message through the initial input of information into the equations prior to the wave.

It is the infinite nonlocal 0 that connects the local concepts of the finite 1. When a 1 changes position, the hole that it identifies instantly changes its geometry. This instant change of the 0 is an instant change for the 0 that connects (0) the seemingly separate 1. The mathematics of the wave function is involved with the 0's geometry relative to the electron's (1) motion. The invisible empty space of the 0 is the message that is in place to provide a direc-

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[6] See Chapter 6.

tion and pathway for any object during emission. The nonmessage "awareness" of nothing is necessary for reaching the message awareness of arrival — the reception of something.

Bohm utilizes Schrödinger's wave function in building his new model. As discussed in Chapter Six, the wave function is an isolation of emission. The mathematics limits its information to the probabilities of absorption and not to actual absorption. This is the reason why Schrödinger's wave function explains nothing about an object's location. An object's location is involved with the absorption stage. The use of the measuring (message) device is absorption and completes the object's wave of departure (emission). When humans locate a particle, they are aware of the 1 which is the message stage. The mathematics of Schrödinger's wave function is the particle's nonmessage recognition of the shape of its field (0) for emission. In this case, the nonmessage is the message. The wave function's field (0) message requires no arrival because the field (0) is always connected to and part of the particle (electron). The message for the electron during the wave function is the nonmessage of the nonphysical (0) necessary for the electron's motional emission to reach a physical message (absorption).

The velocity of light is the photon's motion (wave) necessary to reach absorption. During light's transmission, it is connected to the emission message of the pilot wave field (0). It is easier to understand why instantaneous phase connections cannot occur when the separate stages of emission and absorption are understood. For example, the transmission of light is the emission phase for the photon. For light to have an instantaneous phase connection would require a photon to have absorption from one hole to another without transmission (motional wave of emission). Absorption would be required to stand alone. Such a phenomenon has not been seen in nature. Both emission and absorption are required for the existence of either one. Instant connections from one absorbing process to the next are impossible whether or not velocities for objects can exceed the speed of light. An object must have velocity to leave one hole for its purpose of arriving in

another hole. This becomes apparent when momentum (emission) is separated from position (absorption).

Einstein showed that the gravitational field of nothing (space) and the gravitational mass are mutually dependent upon each other. The force of attraction involves both mass and space. Gravitational mass (1) is attracted to the gravitational field (0) and the field is attracted to the mass. If the distance between the mass of two objects increases, the field (distance) becomes larger, giving less definition and organization to the field. This lessens the attraction force between them. A closer distance with the same mass results in a smaller field with the 0 more organized by the matter involved. This leads to a greater attraction between the 1 and 0.

Newton's inverse-square law describes how changes in distance (0) change the attraction force of gravity. The 0 of the distance is always in place between objects, and a change in distance is a change in the shape and amount of the gravitational field (0). Closer together means more attraction and further apart means less attraction. This is an example of how changes in the 0 distance influence objects instantaneously with the arrival of the usual concept of a physical message. The nonphysical message of the 0 is an awareness that is always connected to and influences the 1 during its motion. The changing field force of the 0 permeates and connects all of the physical world. This explains David Bohm's use of the term "unbroken wholeness." The physical and nonphysical may appear to be broken and separate, but once their interdependent nature is perceived, we can then grasp the idea of universal wholeness.

Newton's explanation of gravity as a force at a distance can now be more clearly understood. The force that influences the 1 is the 0 connected to the 1. The 0 connection can extend out to whatever distance (0) is involved between bodies. The 0 is also connected to the 1 within the microcosm. The field of the 0 pilot wave connects and guides the 1 of the electron and all objects.

The interdependent nature of the 0 and 1 means that what occurs to the 0 also occurs to the 1. When changes in something

(1) instantly change nothing (0), nothing in turn instantly changes something.

The presumed necessity of incorporating an absorption message into Bohm's mathematical construct is an attempt to place absorption into emission. Physicists have attempted to infuse an arrival concept on a departure concept. The electron can never be influenced by an absorption message until its arrival. The wave function only involves the electron's nonphysical recognition of its field (0) for the purpose of reaching the recognition of the physical (1) message of arrival.

The mutual awareness of the 1 and 0 to each other is caused by the extreme contrasting nature of each. All human sensitivity is a derivative of this 0 and 1 binary foundation. The sensitivity derivation from 1 and 0, with the subsequent actions and reactions, is extendible to all objects. The principles determining human responses to their environment are the same for all systems.

The conclusion here is that Bohm's model is an object's (1) involvement with its awareness of its field (0). This is the wave of emission. When emission is completed by absorption, an awareness of the 1 is reached for an object. The physical is involved in the mental absorption of the human message. The wave function is an emission process that does not involve absorption.

When Bohm applied the idea of waves and particles he used the 0 and 1 that are in reality the components of a wave. The wave as well as all natural phenomena are dependent upon both 0 and 1. This provides the inseparable connections that form the wholeness of nature. What is commonly called a wave is the emission phase that combines the 1 and 0 with the 1's "awareness" and use of the 0 for its propagation.

Mental messages (signals) indicate something is arriving to give information. But in Bohm's model there is no arrival process because the 0 field is always guiding the object to reach an arrival. To depart, it is first necessary to both have and to be aware of the pathway of nothing.

The concept of "instantaneous phase connection" violates Einstein's principle that nothing can exceed the speed of light. Let's

examine light in relationship to ourselves. It is the velocity of light during its emission phase that allows the light to reach us. Emission is always prior to absorption. The signal, message and information conveyed by photons of light absorption can only occur with the prior condition of the emission of light. This means that connections through signals and messages cannot be instantaneous because they require the prior condition of motion (emission) before the connections. The pilot wave and its electron is part of this prior condition of emission. It is pointless to talk about instantaneous phase connections during the phase of motion precisely because it is an internal contradiction. All connections require the cessation of motion. Bohm's model is an involvement with the object in motion (emission) which is prior to the arrival of the physical message.

To claim instant physical connections (absorption) during motion is an attempt to make the process of arrival simultaneously a departure process. The electron is guided by the path of the pilot wave (0) and will not be part of a message until the electron is part of absorption. Being part of the wave is a nonphysical awareness stage prior to a physical awareness stage (absorption). A message is a physical defining process and Bohm's model is part of the nondefining stage that is always a prior condition.

The field (0) of the electron is the nonmessage and noninformation stage required to guide it to the message and information stage. This is another example of the *off* being necessary to know and reach the *on,* and conversely. Bohm is involved with the *off* phase. There is no violation of the speed of light limitation because there is no direct involvement with physical absorption during the wave. To understand cause and effect, it is essential to be aware of which stage is occurring. With Bohm's model there is only departure and the nonphysical message stage. The arrival and physical message stage is not included.

The pilot wave is also applicable to the single particle and its approach to the double slit. Two slits compared to one slit changes the geometry of the field (pilot wave). The photon (1) attached to the field (0) instantly "recognizes" the availability of

two holes in its approach. Is the photon's "decision" for a pathway to the target predetermined by its awareness of the two nonphysical paths presented? Perhaps the premise of interference — due to diffraction after passage through the slits — is wrong in determining the pathway to the target. Or do single particles react differently than do particle combinations of light waves? If true, this could explain why recording devices placed at the slits cause the particle, when recorded, to seek a path to the target provided by a single slit. The recording of a particle represents an absorption process for that particle. Absorption collapses the wave providing a physical message for changing the particle's reactive awareness to its field (0 pathway). As the particle emerges from the recorder with information of its new field (0) it reacts accordingly. The particle emerges from the recorder as a new wave of emission with a new nonphysical (pilot wave) awareness. A physical awareness response at the recorder provides a changing nonphysical response for its approach to the target. Every time there is a physical change, such as the introduction of a recording device in the path, it unavoidably changes the nonphysical pathway. All objects (including particles) appear to be attached to the nonphysical and respond accordingly to any physical changes that determine the 0's geometry. Attaching the 0 to the 1 will provide answers to this seemingly unanswerable question of how single particles (one after the other) can produce the alternating patterns on the target of the double-slit experiment.

Awareness of the physical and nonphysical are simultaneous. At absorption a physical recognition is joined with a nonphysical recognition. A nonphysical recognition is necessary to begin another wave of emission. Changes of the nonphysical are instantly recognized with the physical message. The physical (1) message of absorption is reached through energy (motion) input. The accompanying nonphysical recognition provides the information necessary for the energy output of emission.

CHAPTER 10

GRAVITY AND THE UNIFICATION OF THE FORCES

IN THE PRECEDING CHAPTER there was a brief discussion of gravitational mass (1) and gravitational field (0) as the 1 and 0 responsible for the gravitational attraction force. All forces of attraction result from this same principle. Only the geometrical shape of anti-matter holes and the matter that fills and empties these holes will be different. Why the sun and planets are attracted to each other can now be stated with greater precision. The attraction and motion between astronomical bodies parallels the earlier example of attraction between an empty (thirsty) human body and a body of water. The human attraction of moving an empty (0) container toward water (1) and to moving the water (1) into the empty (0) stomach follows the same binary principle that regulates astronomical bodies. The attraction between 1s and 0s explains why women and men are attracted to each other as well as why the earth and sun are attracted to each other. The 0-to-1 and 1-to-0 attraction force with its positional goal is a part of all motion.

Physicists have identified four forces in nature. These forces are referred to as weak, strong, electromagnetic and gravity. The problem in unifying these different forces is finding their common denominator. The 1 and 0 is the common foundation of these four universal forces. The forces of the weak, strong, electromagnetic and gravity can be related and explained — unified — with the two forces of repulsion (0-on-0 and 1-on-1) and attraction (0-to-1 and 1-to-0). Only these two forces are necessary to identify and explain universal cause and effect.

Gravity is said to exhibit only an attraction force. Scientists have failed to include gravity as part of the electromagnetic force because gravity does not appear to demonstrate a force of repulsion which is part of the electromagnetic force. However, all resistance to motion is part of the repulsion force. The 1's attraction to use the 0 pathway is guided by the repulsion force. The 0 pathway is only defined by areas where the 1 can both move (attraction force) and not move (repulsion force). The information of where an object cannot go provides the object the information of where it can go. The weak force, the strong force, the electromagnetic force and the gravitational force are all combinations of different structures exhibiting emission and absorption by using attraction and repulsion.

Using the human concepts in describing action other than human action is aimed at demonstrating that all objects, including humans, derive "goals" and a "purpose" through an "awareness" of the force of attraction and repulsion. All systems, human and nonhuman, have motion because of an attraction force to fill (1) their spaces (0). Humans may have more versatility in their choice of 0s and 1s for reaching positional fills but nevertheless, this is the *reason* for all universal action. The universe is a structured series of switches that oscillate between the *on* switch of absorption and the *off* switch of emission.

The solar system's planetary emission with its positional (absorption) goal of the sun's center uses attraction and repulsion forces in directing this planetary motion. Nature's organic and inorganic structures use attraction and repulsion in their emis-

sional motion leading to positional absorption. This is how objects "know" to choose the "best" possible path. The reason objects unerringly "know" how to pick the optimum trajectory has always amazed physicists. Sensitivity to the force of repulsion is reached by the presence of the attraction force and conversely. They are constant companions in emission and absorption events. Humans use the repulsion force in all their actions. Gravity's attraction and the resulting motional events are not possible without repulsion.

In his *In Search of the Big Bang,*[1] John Gribbin explains the problem of determining the difference between gravitational mass and inertial mass.

> In Newton's Second Law, force equals mass times acceleration. The mass involved represents the amount of a body's resistance to changes in motion, its inertial mass. The gravitational force between two objects also depends on mass. Gravity is also proportional to mass, and there is no way to distinguish between the gravitational mass and the inertial mass of an object. Why would these two masses be identical? After all, one represents the ability of a body to reach out and pull on other bodies, while the other represents the resistance of a body to being pushed by other bodies. Logically they could be quite different from one another.

In the above, the inference is that gravity is the mass of a body reaching out and pulling on the mass of another body. This is another example of tunnel vision narrowing the view of nature to only the physical. To use the term "bodies" in this context only makes sense if it is understood that bodies include both the physical (1) and the nonphysical (0). Gravitational mass (1) can only be defined and understood within the framework of the gravitational field (0) and conversely.

To understand the difference between *gravitational mass* and *inertial mass* requires an introduction to the concept of the 0 as it

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[1] Gribbin, John, 1986. *In Search of the Big Bang: Quantum Physics and Cosmology.* New York: Doubleday. Page 102.

relates to the 1 of mass. The gravitational mass of two different bodies may appear to be mass pulling upon mass, but the appearance is deceptive. Instead, it is the 1s of each body reaching out and pulling on the corresponding 0s of each body and at the same time the 0's of each body pulling on the corresponding 1s of each body. This attraction force involves all the structures within these bodies. The 0s of both bodies are attracted to the 1s of both bodies and the 1s of both to the 0s of both. By involving all the 0s and 1s of atomic structure, it necessarily includes the strong, weak, and electromagnetic forces as components of the gravitational force. The force of the gravitational attraction between two bodies represents the matter (1) and the anti-matter (0) attraction between both bodies.

Gravitation is not noticed in general until extremely large numbers of 0s and 1s are interacting. Electromagnetic attraction is part of gravitational attraction. The repulsive and attractive effects that are part of electrical phenomena are also part of gravitation. Inertia is an example of repulsion. Inertial mass represents the resistance (1-on-1) of the mass of one body to being pushed by the mass of another body. Gravitational mass is mass that also has inertial repulsion and is an example of how repulsion is a part of gravitational attraction. A body's inertial mass only has reference to the repulsion of a mass on mass (1-on-1), but inertia is also involved with the repulsion of nonmass to nonmass (0-on-0). In future discussions, inertial mass will be referred to with the understanding that the inertia of bodies involves both the 1-on-1 and the 0-on-0 of the repulsion force. To refer only to inertial mass (1-on-1) is another failure to see that inertia and its resistance to motion are part of both the 1 and the 0. Inertia represents the repulsion effects of both a 1-on-1 confrontation and a 0-on-0 confrontation.

Gravitational mass (1) cannot be identified until we associate it with the gravitational field (0). Gravitational mass and inertial mass cannot be understood until each is properly related to another concept. Another concept to be explained. In contrast, contemporary physics has intellectually isolated the mass of grav-

ity and the mass of inertia by concluding there is only physical matter to explain and comprehend. In short, mass is all there is to identify. However, mass shows its inertial (repulsion) and gravitational effects by a different relationship. Inertial mass is one discrete mass in its resistance (1-to-1) to another discrete mass. Gravitational mass is mass attracted to its field (0). Gravitational mass (1) can be correctly identified when it is a part of the corresponding gravitational field (0). The interdependence of mass (1) and field (0) creates the force of attraction. The two concepts of mass (1) and field (0) explain and identify the force of attraction. The 1 of mass "wants" to fill the 0 of the field as the 0 of the field "wants" to be filled. All motion is for this "purpose." *Gravitational mass* can now be defined as the attraction of mass to its field (0).

The same mass that is gravitational mass also has inertial properties of repulsion. Mass has the inertia of resistance when it is confronted by mass. Inertial mass is created by mass (1) resisting mass (1) and gravitation is created by its attraction (1-to-0 and 0-to-1) between mass and its field (0). Inertia is the force of repulsion due to the impossibility of a 1 occupying a 1 and a 0 occupying a 0. Inertia is an excellent example of the necessity of using the binary (0 and 1) approach for understanding all phenomena of nature.

Attraction with its 0 and 1 availability for motion is not possible without repulsion. Repulsion and attraction work together as a team. For an object to define a pathway, the object must define where it can and cannot go. Motion through attraction is defined by nonmotion through repulsion. Nonmotion through repulsion is defined by motion through attraction. Inertial mass is created by the impossible (repulsion force) where mass confronts mass. Gravitational mass is created by the possible (attraction force) when mass (1) has the availability of its field (0). Impossible (0-on-0 and 1-on-1) defines possible (1-to-0 and 0-to-1) and possible defines impossible.

Electrical repulsion of rubbing the silk cloths is part of the gravitational effects because electromagnetic effects are a natural part of gravity. To show the repulsion relationship of two silk

cloths in massive bodies, it would be necessary to somehow concentrate the 0-on-0 and 1-on-1 of massive bodies in the same way as in the example of the silk cloths.[2] The size of planetary objects would make this difficult, but not impossible in principle. Humans incorporate repulsion into every act of motion and their machines use the repulsion of inertial resistance to propel humans in the direction of choice. The gravitational effect of weight is a combination of gravitational attraction and the inertial force of repulsion. Nature does not allow an attraction force and its resulting motion to occur without the use of repulsion.

All motion, including planetary motion around the stars, uses both forces: attraction and repulsion. How do objects "know" the path for motion? All objects detect where they can go because the borders for the path of motion define what does not allow motion. And yet, why is it that humans focus on what attracts them while never realizing that what repels them is what guides them to what attracts them in the first place? Where we cannot go and do not want to go, is always very much a part of where we do want to go. Everything comes down to the ability to comprehend these two forces — attraction and repulsion — in order to use them to our advantage. These principles of repulsion and attraction are part of the motion of all objects. How many structures use and "understand" these forces better than humans?

Newton's equation that force equals mass times acceleration (F=ma) shows that force is actually a composite of separate forces. The mass within the equation involves the inertial force that is part of repulsion and the acceleration of mass that is part of the force of attraction. Mass and its resistance to motion transfer motion (energy) from one body to another. This transfer is an energy input leading to an energy output. The output of energy is acceleration. Acceleration is emission which occurs because input through inertial mass leads to output. Where motion cannot go is necessary for the transfer of motion to where it can go through an

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[2] See Chapter 3 on electromagnetic phenomena.

acceleration process. The inertial makeup of mass (1) and non-mass (0) results in the repulsion force and is used by the attraction force in reaching motion (acceleration). This demonstrates the necessity of opposites: resistance is necessary to reach nonresistance and nonresistance is necessary to reach resistance. Emission-to-absorption and absorption-to-emission are interplays between these two forces. The inertia of repulsion is used to push off and start (acceleration) in a specific direction and the inertia of repulsion is used to stop motion in arrival at a specific location. Repulsion leads to emission through attraction and emission leads to absorption through the use of repulsion. Repulsion is used to start motion and to stop motion.

All four forces (and others that may exist), can be explained with repulsion and attraction. This concurs with Newton's reasons for believing there are two forces, *"particles of bodies ..... are either mutually attracted towards one another, and cohere in regular figures, or are repelled and recede from one another."*[3] All interactions between objects use attraction and repulsion.

An awareness of the binary 0 and 1 that form the force of attraction and repulsion will enable humans to harness forces for the development of clean energy and a safer planet on which to live. Electrical energy is largely nonpolluting and uses the 1 of the electron and its attraction to its field (0). Electrical phenomena involve the use of 1s and 0s surrounding the nucleus.

To advance human harnessing of nature, it is necessary to directly involve the 1s and 0s of the nucleus. We must take control of the nucleus by disrupting the normal balance it has between matter (1) and anti-matter (0) states. This can be accomplished by creating a large potential between the matter and anti-matter states of the nucleus. A practical strategy would be to isolate the nucleus into more empty (0) anti-matter states and more filled (1) matter states. Then with more powerful combinations of repulsion states leading to greater motion through attraction, humans will

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[3] Partial quote from *Principia Mathematica* in Chapter 3.

have gained the use of a powerful new energy source. This will provide a clean source of motion (energy) similar in its cleanness to electrical energy. Such a change in technological advancement would be more profound than the earlier change brought about by the broad usage of electrical energy. This would enable the efficient exploration, utilization and population of the habitable satellites of the solar system. With such an efficient energy source, the next venture would be to explore our galaxy. The possibility for our species to eventually become a significant presence in the universe would be enhanced.

There is, however, an impediment to such lofty dreams. We are now standing on the threshold of our own destruction. The planet's hospitality may already be doomed. Already the problems created by our solutions of the past are screaming for new solutions. This is the principle that solutions lead to new problems which require new solutions to enable structures to continue their evolution. These new solutions hinge upon our ability to recognize the profound impact of the 0s upon the 1s of the physical world. Comprehension of the 0's function in nature is paramount to solving our major problems. The 0 is an integral and powerful part of the forces of nature.

The possibilities for advancement through the use of nuclear attraction and repulsion forces are large. This could provide protection for property, persons and nations from predatory action.

These ideas are an approach to solutions for our present problems. This will not be easy, but seeing a new and better direction is an important start. The beginning of any journey starts with seeing the goal and then constructing the path. There are always enough problems to keep us challenged. It is better to go down swinging at a problem than go down without swinging at all. Defining our most important problems is requisite to finding their solutions.

KALUZA-KLEIN THEORY

In 1919, Theodor Kaluza developed a remarkable addition to relativity theory. Kaluza decided to see what might emerge by

adding a fifth dimension to the equations of Einstein's General Theory of Relativity. These are the same equations involved with the interdependent gravitational mass (1) and the gravitational field (0). Einstein only dealt with four dimensions, three of space and one of time. Kaluza's addition of a fifth dimension produced surprising results. The same set of gravitational equations occurred as in Einstein's four dimensions, but by adding a fifth dimension an additional set of equations emerged: Maxwell's equations of electromagnetic phenomena. Through the mathematical addition of a fifth dimension, gravity and electromagnetism were unified.

The Kaluza-Klein theory supports the conclusions reached here that gravity includes all the forces associated with nature's structure of 0s and 1s. Gravitational mass (1) and its corresponding field (0) have their origin in the 0s and 1s of the atomic world. Electromagnetism on a universal scale (the scale of stars and planets) is part of the gravitational expression.

In curving, shaping and warping the space (0) of the gravitational field, Einstein seems to make reference to the space (0) surrounding and outside the physical borders of the surface of large bodies involved with gravitational mass (1). However, the conclusion here is that the space inside these massive bodies must also be part of the gravitational field. The 0s and 1s associated with electromagnetism, weak force, strong force and any other 0s and 1s that may create some undiscovered forces are all combined together in the gravitational expression.

At the atomic level there is almost all space. If a nucleus the size of a pea could be placed in the middle of a football stadium, the first electron orbit would circle above the top row. This relatively small amount of nuclear mass with its electrons shapes, curves and organizes the space inside bodies such as stars and planets. The space external to this internal space — like the space between the earth and sun — is an extension of the internal organized space. The 0 is always the connecting principle to the physical parts of nature. The farther two bodies are from each other, the greater the space (external and internal) associated with mass.

The increase of the 0 with the same mass (1) decreases spatial organization with the result of less attraction between 0s and 1s. With a decrease in distance, there is less space (0) with respect to the amount of mass. This increases spatial structuring and results in an increase in the attraction force between 0s and 1s.

It is the 0 that connects two distant bodies that makes the electromagnetic 0s and 1s of each body a part of the overall phenomenon of gravity. Gravity is relatively weak because most of the 0s and 1s within atomic structures are balanced. The two silk cloths show this tendency to return to a balance after the imbalance caused from rubbing.[4] After the balance returns, the cloths come apart. The 0s and 1s of the two cloths, however, are still attracted to each other, but not strongly enough to cause motion away from (repulsion) or toward (attraction) each other. To show gravity and its attraction leading to motion, it is necessary to bring together great numbers of atoms that make up the 0s and 1s of planetary and galactic systems. Gravity is the total overall attraction and repulsion in the atomic world of which electromagnetism is only a part. The 0s and 1s that are part of the strong force, weak force and all structures are also involved with gravitational effects.

Gravity has been the mysterious force that seems to resist all attempts to unify it with other known forces. The reason for this difficulty of unification is that gravity is a combined expression between common 0s and 1s for all of nature's bodies. Gravity is the total communication of attraction and repulsion between all the corresponding 1s and 0s within each gravitational body. For humans, gravity is the 1s of the atoms of the human body attracted to the corresponding 0s of atoms of the earth and the 0s of the human body attracted to the corresponding 1s of the earth. And also simultaneously the earth's 0s and 1s are attracted in like manner to the 0s and 1s of the human body.

Gravitational attraction is between related matter (1) and antimatter (0) states. In particle physics, physicists usually do not

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[4] See Chapter 3 on electromagnetic phenomena.

directly observe anti-matter states because particle collisions destroy the spatial organization that identifies antimatter (0). These expensive machines — such as particle accelerators — destroy (remove) the spatial relationships that are an integral part of all objects. Physicists have not observed all of the different kinds of particles their mathematics have predicted. "Quarks" are part of these yet to be observed predictions. It may be that such predictions are a part of anti-matter (0) states. If this is the case, then they will never be seen because they represent spatial organization that is destroyed in the apart phase as the particle accelerations in these experimental accelerators reach impact. Whatever piece of the particle is observed, as a result of its artificial destruction, it completely changes the previous geometry of the 0. Particle physicists will begin to solve the anomalies of particle physics when they recognize the concept that all objects — large and small — have both a 0 entity and a 1 entity. There must be a paradigm shift from this concentration on the physical to a concentration on both the physical and the nonphysical. A universe of antimatter (0) is waiting for human identification and utilization.

SPACE (0) TIME (1)

The term "space-time" is another expression of our binary (1 and 0) universe. The term "space" is made up of the three dimensions that are defined by the physical (1) that uses this space (0) to reach absorption. Time represents the physical filling of space (0) through absorption. At absorption the physical of the absorbed object is within the stationary 0 defined by the physical framework of the absorber. Positional time is then obtained by measurements (definitions) of the object's position through its relationship to the geometrical height, width and depth of the nonphysical. The 1 is necessary to understand the 0 and the 0 is necessary to understand the 1. This is why space (0) and time (1) are irrevocably joined together. The "tick" of the time of absorption is only possible through the physical's use (emission) of the spatial (0) medium. Space allows time and time allows space.

The fourth dimension of time (position of the physical) defines the three of space and the three of space define the fourth dimension of time. Space-time can be considered in only one dimension in the sense that space and time are dependent upon each other and joined together in a single and whole concept. Space (0) and time (1) are separate in their contrasting nature, but they are joined in their dependency on one another.

Is it possible that the equations of Einstein's General Theory of Relativity indicate space-time as a single-dimensional concept and Kaluza's dimensional addition indicates another space-time dimension? Is it possible that there is a single space-time dimension for the macrocosm of gravity and another space-time dimension for the microcosm of electromagnetism? This would indicate that another time dimension is involved at the electromagnetic level with the same three dimensions of space. When Kaluza added a fifth dimension, it was an addition of a new time dimension instead of an addition of a new *space* dimension. Different time dimensions are involved with the same three dimensions of space. How many more time dimensions extend microcosmically inward and macrocosmically outward? Particle physicists contend that the extremely short life (positional time beats)[5] of particles is for "them" a lifetime. They go through a lifetime of emission-to-absorption events within a time frame that lasts only a few microseconds for us. It appears that different dimensions may be involved with *time* rather than *space*.

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[5] See Chapter 8 on Time (1) and Nontime (0).

CHAPTER 11

RANDOMNESS, ORDER AND PURPOSE

THE LATE PHYSICIST, HEINZ PAGEL, in *Cosmic Code,*[1] demonstrates that twentieth-century physics and mathematics have yet to produce a definition for randomness. What is there about randomness that defies the construction of a meaningful and useful definition? Heinz Pagel states the irony of randomness:

> In part the problem of precisely defining randomness, or more specifically a random sequence of integers, is that if you succeed in giving an exact definition the sequence may no longer be random. Being able to say precisely what randomness is denies the very nature of randomness, which is utter chaos — how can you be precise about chaos?

When a random sequence of integers is precisely defined, its "randomness" may be defined away. What is

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[1] Pagel, Heinz R., 1982. *The Cosmic Code: Quantum Physics as the Language of Nature.* New York: Simon and Schuster. Page 105.

there about precision, definitions and understanding that deny the nature of randomness? True randomness is a part of disorder and chaos. To have knowledge of disorderly and chaotic processes is to also have an internal contradiction. To be knowledgeable of something, it is first necessary to reach a definition of that something. Acquiring information (knowledge) of a system is to create order out of an initial state of disorder (ignorance). Randomness with its related disorder and chaos is part of ignorance and the inability to define. How can *randomness* be defined when it is part of a nondefined state?

Continuing observation (information) of a random sequence of integers reveals areas of nonrandomness. Integers have a certain value and there is an orderly determination of the difference of value between them. Each integer retains a constant value which is not random. The integers occupy set locations definable by their specific positional relationships to each other and to the observer or to anything else that may be involved. The conventional distance between integers is usually the same, which is certainly not random. Taking a random sequence of integers and applying it to a combination lock makes it definable (nonrandom) in its relationship to the lock. The observed so-called "random" integers have a set positional relationship to the observer which is definable. To observe any object's positional relationship to other objects makes it definable and nonrandom through this positional relationship. Definitions create the positional relationships between objects. A physical object is defined by the nonphysical space adjacent to it and the nonphysical space is defined by the physical adjacent to that space. Position provides stationary events for measuring (defining) 0 and 1 relationships.

The problem of undefinable randomness can be solved by relating it to its opposite: nonrandomness. Nonrandomness is the positional process of relationships brought about through absorption (observation) and is the defining process accomplished by positional absorption. The nonrandomness of definitions is knowledge preceded by randomness with its nondefining igno-

rance. The 0 of random's ignorance is always a necessary prior condition to the 1 of nonrandom's knowledge (nonignorance).

Human observation is the nonrandom event of mental position used for relating one thing to another. The opposite is the ignorance and randomness involved with the motional emission necessary to reach positional absorption. Again, there is a return to emission and absorption for explaining universal action and the human vocabulary describing this action.

The wave function refers to all motion which includes randomness, chaos, chance, uncertainty, indeterminacy and disorder. All of these terms relate to the infinite (0) possibilities of absorption during motion (wave). The 0 has an infinite number of specific locations along the path of motion for reaching position. There are an infinite number of positional possibilities prior to any one of them being activated. It is this infinity of possibilities of position that requires nature to be involved with random, chance, chaos, uncertainty, indeterminacy and disorder. Nature cannot predetermine its destiny (destination) when emission is faced with infinite possibilities of absorption. The possible is indeterminate and uncertain until absorption (arrival) takes place.

When emission (wave) reaches the human act of looking (absorption), we change random to nonrandom, indeterminacy to determinacy, disorder to order, uncertainty to certainty and chaos to nonchaos. The roll of the dice initiating motion is a human confrontation with chance, randomness, uncertainty, indeterminism, chaos and disorder. When the motion (emission) of the dice stops, the wave collapses for the dice and the human observers. The human state of actualization is reached because the dice have reached a positional state where the numbers are discernible. The negative opposites during the wave have now been reversed to the positive opposites because of the positive addition of arrival. The negative question has changed to the positive answer. This is another example of how opposites require each other. When a physicist wants positional knowledge of a particle during a wave function, this is the same as wanting positional knowledge of the dice number during the roll of the dice. Ignorance is the nonar-

rival stage that is always a prior condition to knowledge and the arrival stage.

There is now a way to solve the problem of defining randomness. Randomness is the nondefining state required to reach the defining state of mental arrival. To observe cannot, then, be random because it defines a positional relationship between the observer and the observed. Randomness is the inability to know where things are relative to ourselves because we have not yet observed. When humans observe they convert randomness to nonrandomness. When observing, a sequence of positional relationships become known to the observer. *Randomness is defined as the state of not having a definition.*[2] Randomness is a nondefinable state for the mind. Nondefinitions (0) are necessary to reach definitions (1) and conversely. Randomness is the opposite state for reaching the nonrandom state.

A random sequence of integers is a statement of our inability to reach the knowledgeable state of an orderly, nonchaotic and nonrandom state of integers. Randomness can be said to be a state of ignorance. By increasing the number of positional relationships, we increase the defining process of absorption (observation) necessary to reach nonrandomness (knowledge). Randomness is a lack of perception (observation) which can lead to a successful perception (nonrandom).

ORDER (1) AND DISORDER (0)

It has been said by scores of important scientists that all attempts to obviate or refute the Second Law of Thermodynamics will come to absolute and utter failure. Embarking on a critique of this most prominent law of physics is like going where those proverbial angels fear to tread. Nonetheless, there is more to learn about this formidable law. The subject of the Second Law of Thermodynamics will be briefly discussed.

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[2] Definitions specify positional relationships between the observer and the observed that are obtained by mental absorption through observation.

As every physics student knows, the Second Law of Thermodynamics deals with the measurement of disorder in the universe and that measurement is commonly referred to as *entropy.* This law proclaims a universe tending toward disorder that will eventually reach a state of total entropy. Total entropy is a complete state of disordered energy. Disordered energy is said to be energy in a state where it can no longer be used in its transfer patterns from one object to another. Energy is said to still exist, but it is no longer useful for energy exchange. The eventual result is the complete loss of the availability of useful energy for continuing universal action. This also has been called the "heat death of the universe." It is stated that in the end — end of the universe — one temperature will prevail without the thermal differences necessary for motion (energy). The necessary high-energy-to-low-energy relationships for the continuation of universal action are said to be lost.

This pessimistic law predicting the death of the universe may have been devised due to the failure to identify the role of the 0 in energy's relationship to order and disorder. By demonstrating the relationship of energy to order and disorder and that this relationship is fundamental to emission and absorption events, there emerges a different view of the availability of energy.

Ignorance is the 0 of the empty state of disorder for humans. Knowledge is the filled (1) state of order for humans. With the fill of absorption, we reach a state of knowledge that changes disorder (0) into order (1). This is the fill of a mental 0, but there are other human 0s to be filled and emptied. For humans, every fill with arrival creates a state of order (1) and every empty with the departure of order and the emergence of the 0 creates a state of disorder. Human absorption and order (1) produces emission and disorder (0) for other related objects. For every state of order (absorption producing the fill) there is also a state of disorder (emission producing the empty) somewhere. When there is a fill there is also an empty. Converting disorder into order in one area creates a conversion of order into disorder in another area. This balances disorder and order, allowing the 0 of a disorderly empty

state to always be available for reaching another 1 of an orderly filled state. New order (1) always produces new disorder (0) and, conversely, emerging disorder provides an emerging order. A natural balance between order and disorder is always maintained. The 1 of the matter state of order is conserved and the 0 of the anti-matter state of disorder is conserved.[3]

Energy is motion for emission (energy output) and energy is motion for reaching absorption (energy input). Disorder is a result of energy output (emission) and order is the result of energy input (absorption). Energy input and output create order and disorder and one cannot occur without the other. Neither the magnitude of energy output (disorder) nor energy input (order) can decrease or increase over each other because one cannot occur without the previous condition of the other. Energy — an object's motion — always has the availability of a 0 for input and output in transferring its energy (motion) from one object to another.

When we interact with our surroundings, there is an exchange of order and disorder. All interactions in nature involve the exchange of matter (1) and anti-matter (0) states through the use of motion (energy). The matter state is the positive of order (+) and the anti-matter state is the negative of disorder (-). Whenever a house is in a negative condition, it represents holes that are available for filling. To reach the positive, we use the additive process of filling the empty negative. But with every positive addition, we also create a negative subtraction. When the food is cleared *off* (-) the table and put *on* (+) the refrigerator shelf, the refrigerator gains more positives from its filling and the table gains more negatives from its emptying. The refrigerator has reached a state of greater order and the table has reached a state of greater disorder. This state of disorder for the table is a necessary prior condition for returning to the ordered state. The usefulness of

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[3] Corollary #7 – The physical and nonphysical cannot be created or destroyed; their shape and form will change, but the amount of both will always be conserved.

both states can be seen because they provide an oscillation — back-and-forth — between the two states. One is always available for reaching the other.

In housecleaning, the "goal" is to return order (1) and disorder (0) to the proper state of readiness so these 1-and-0 states can be readily exchanged. Housecleaning creates a balance for reaching emission-to-absorption events of choice. A dirty dish requires washing to bring it back to the disordered (0) and empty negative state before the dish can reach another ordered (1) and filled positive state. For human survival, it is important to keep these 0-and-1 states ready for use. Humans cannot fill other systems or fill their own system unless the prior empty stage (disorder) is available to them. Nature requires this 0-and-1 balance for a stable universe. The question follows, with this new binary perspective of order and disorder, how can the universe reach a total state of disorder (entropy) when DISORDER must always be in balance with ORDER — the opposite of entropy? Opposites must always be in balance. Interpreting nature's laws is entirely different when the 0s are coequal companions to the 1s.

Disorder is defined as the empty anti-matter state of any object and order is defined as the filled matter state of any object. This definition of order and disorder defines a universe that is in an overall balanced state. *Frequency* is the emission and absorption oscillation that each structure uses for survival. When order-and-disorder exchanges do not occur, then the structure will make way for those structures that produce this equilibrium.

The Second Law of Thermodynamics predicts this entropic pessimism for the future of the universe on the assumption that the universe is a closed system. Corollary #9 (the rule that to know one opposite is to know the other opposite and that opposites cannot stand alone) indicates that a closed concept cannot stand alone. When one system is closed, it requires that another system be opened. In this case a closed system refers to the filled orderly state while the open system refers to the empty disorderly state. It is erroneous and misleading to refer to nature as being involved with only one opposite and not the other opposite.

Nature's action is a rhythmic antonymic fluctuation between the open anti-matter state and the closed matter state.

The Second Law of Thermodynamics defines the universe as a closed system where there is no input or output of energy. The question arises, how is a closed system possible without energy input and output when the universe is composed of systems using energy input and output? How can we create a closed system outside of a universe of systems that by nature must maintain a balance between empty states of anti-matter (disorder) and filled states of matter (order)? In defining any system, its definition must include oscillations between the absorption of energy input and the emission of energy output. Systems cannot exist that do not both open (0) and close (1). The systems of the universe can only exist through energy inputs and outputs. To hypothecate the universe as a closed system without energy inputs or outputs is to hypothecate an enigma. The existence of the universe is dependent upon these binary oscillations. To say the universe is closed is to negate the open (0) and closed (1) requirements for its existence.

The prediction of a universe that reaches a state of disordered and nonuseful energy is derived from an incomplete understanding of the nature of energy. In Chapter Eight, mass and energy are discussed and energy is defined as *motion.* In a universe of only disordered energy it is said there are no thermal differences and that motion cannot proceed without a thermal (temperature) difference. Because energy is motion, this entropic hypothesis of classical physics produces an internal contradiction. If energy is motion, then a state of *no motion* indicates a state of *no energy.* The concept of "disordered energy" proclaims the existence of energy without the ability to use energy. However, if energy is motion and a complete state of disordered energy means nonmotion — as in the "heat death of the universe" — then instead of disordered energy we have a state of nonenergy (nonmotion). This paradoxical conception of the universe violates the law of the conservation of energy. The pessimism inherent in the Second

Law of Thermodynamics arises from the failure to precisely define energy.

All opposites are related to each other through the 0 and the 1. *Hot* and *cold* are opposites. Hot has a greater frequency of in-and-out processes than does cold. To produce a hot area means transferring greater motion/energy from one area to another. Hot is motion/energy input that also produces cold from an adjacent energy output. Having a hot area also means having a cold area. For motion/energy to arrive, it must depart elsewhere. *Arrival* without *departure* is impossible. The hot of *more* energy also produces the cold of *less* energy. A hot condition with the addition (+) of energy in one area, means a cold condition with a subtraction (-) of energy in another area. Excess hot must yield somewhere else a deficit cold and a deficit cold must yield somewhere else an excess hot. The compaction of hot generates the rarefaction of cold. Thus, balance and symmetry is maintained. How can total entropy and the heat death — a universal homogenous temperature — of the universe be reached, when all energy inputs (heat) require energy outputs (cold)? In a binary universe, a viable difference in temperature throughout the universe will always be maintained. A continuing difference in temperature is a statement for the continuing maintenance and accessibility of the 0 and 1 for each other.

It is commonly stated that hot always flows to cold. If hot represents more of the 1 in these in-and-out oscillations and cold more of the 0 with less filling and emptying of the 1, then there is an elegant explanation of why hot flows to cold. The cold creates more 0s for the occupation of the hot 1s. The 1s' motion/energy approaches the 0s for entering. This demonstrates the attraction force. Hot represents more energy necessary to move to the cold of less energy. For cold 0s to approach hot 1s for the 0s to be entered, the cold 0s must utilize motion/energy. In the same way, human motion/energy is used to move the 0 of a cold drink toward the 1 of a hot human body. Motion/energy is used to move 0s toward 1s and 1s toward 0s, or both toward each other

and motion/energy is used to replace disorder with order. But the new order will produce new disorder at some other place.

Motion/energy is necessary for the oscillations of order (1) and disorder (0). Arrival and order is accomplished through energy input creating energy output (disorder) to another input (order) to output transformation. Energy output means energy is always available for another energy input. And conversely, energy input means energy is always available for another energy output. Energy is motion that converts order to disorder and disorder to order. The natural necessity of having order and disorder where one cannot consume the other applies to all opposites.

The infinite nature of the universe can be shown through the mutual dependency of opposites. Let us examine the concept of a beginning and an end. Beginning is the start of motional emission for an object and ending is the arrival of positional absorption for an object. It is easier to understand that the end (stop) of motion is defined through the beginning (start) of motion, but it is harder to understand that the beginning (start) of motion is defined through a previous end (stop) of motion. The beginning of emission is not possible unless a position for the start of emission is provided by absorption. Absorption provides the starting position for all motion (emission). Similarly, absorption is not possible without emission. To start means the previous stop of arrival and a stop means a previous start of departure. To have a starting point for emission requires absorption (position). Infinity is built into the interdependence of all opposites in the universe. Beginnings and endings are cyclic events that depend upon each other, because it is impossible to have one without the other.

Now the old chicken-and-egg paradox of priority can be explained. The unfertilized egg is in an empty disorderly anti-matter state waiting to reach a filled and orderly matter state of fertilization and development of the chicken. The disorder of the egg is a prior condition to the order of the chicken. Also, the order of the chicken is a prior condition to the disorder of the egg. A fill (chicken) is necessary to come to an empty (egg) and an empty (egg) is necessary to come to a fill (chicken). All viable oscillating,

emitting and absorbing objects have infinity built into them. To ask which came first, the chicken or the egg, is a meaningless question when dealing with opposites — and that is all there is to deal with. There can be *no firsts* when opposites are involved as in the chicken and the egg. They cycle one after the other. Humans also have cyclical order (1) and disorder (0) events which represent an infinite past. All endings require a prior beginning and all beginnings require a prior ending.

The dynamics of opposites reveal an infinite universe. The physical is the local finite using the infinite nature of the nonlocal nonphysical. The nonphysical has infinite possibilities for its infinite organization by the finite physical. The nonlocal 0 provides infinite possibilities for the local finite 1 to organize the 0 for the 1's fill (order) and empty (disorder).

Our entire lives involve making messes and cleaning them up. A mess follows the enjoyment or gain of "making" the mess in the first place. Satisfaction is found in the utilization and occupation of holes that are necessary for humans to fill their spaces (holes). When the filling process of order is complete, the displaced items that remain are perceived as unwanted disorder. However, the *real* disorder is the 0 of the empty containers (for example, shelves) where the now unused items belong for their proper storage. By replacing these items where they belong for storage, we restore order to the storage containers by filling their holes. When we return our unused food on the table to the refrigerator shelves, the refrigerator now has more order because its spaces are filled. The table now has more disorder because its spaces are unfilled. It may appear that a return to a clean empty space on the table would represent order instead of disorder, but the cleaning and maintenance of the table's holes maintains disorder by creating more space (0) so that the fill of order (1) can be readily accomplished again. By restoring order through filling the storage containers, we have cleaned up the "mess." The cleaning of the mess from the table's surface now brings us back to an empty disordered state necessary for another filled and orderly state. Where humans fill spaces, they replace disorder with order and where

spaces are emptied, they replace order with disorder. Having access to well maintained spaces is having access to orderly (fill) processes. We usually consider a clean and well maintained spatial area as "orderly"; however, the space is disorderly because it enables greater accessibility for the occupation of order. Disorder invites the order. We clean to provide the disordered state for the possibility (1-to-0) of reaching the ordered state.

Energy's involvement in these balanced events of order and disorder indicates energy's continual use — instead of its nonuse — in sharp contrast to the Second Law of Thermodynamics and its dismal prediction of a universal heat death. The continuing exchanges of balanced 1s and 0s conserve the dynamics of energy usage. The changing universe remains in balance between matter (1) and anti-matter (0) states — between balanced states of positive (+) and negative (-) charges. Energy usage through input (1) and output (0) produces changes while maintaining equilibrium. Energy is motion used by the 1 in providing equal states of the *open* (through energy output) and the *closed* (through energy input). Open processes require closed processes elsewhere and conversely. The universe oscillates between both open (0) and closed (1) systems. The infinite nature of order (closed) and disorder (open) is a necessary part of energy. How is it possible to produce entropy and "nonuseful energy" when energy's output (emission phase) is dependent upon its input (absorption phase) and the input of absorption is dependent upon the output of emission? Energy must oscillate between the positive addition of its input and the negative subtraction of its output.

The conclusion is that order and disorder are opposites with their root sources the 1 and the 0. Each depends upon the other for their complementary existence. The universe will not perish from the complete disorder that is predicted by the Second Law of Thermodynamics. The balance and equilibrium between energy input and output will always be conserved. The conservation of useful energy is joined with the conservation of the physical (1) and nonphysical (0). This is explained by the introduction of the 0 and its relationship to the 1 of the physical world. Disorder (0)

cannot surpass order (1) in magnitude as order cannot surpass disorder in magnitude. There are local concentrations of order or disorder, but when order accumulates in one place, disorder accumulates in another place and conversely. Disorder cannot gain on order and order cannot gain on disorder because one cannot occur without the other. According to the Second Law of Thermodynamics, disorder is a destructive process leading to the *death* of the universe. But departing from this dismal view, disorder (entropy) is an important and necessary process leading to the continuing *life* of the universe. Disorder can be explained as a reversible form of death (0) that is necessary to reach the order (1) of life (1). This follows the principle of using a negative (0) to reach a positive (1).

PURPOSE

In *Science, Order, and Creativity,*[4] David Bohm and F. David Peat discuss the Hamilton-Jacobi theory showing that equations within the theory can be derived from the "Variation Principle:"

> Newton's approach to motion was based on the idea of a differential equation that describes motion as a succession of steps in which each state follows continuously from the preceding one in a fashion that is typical of mechanical systems. The variation principle, by contrast, starts not from a differential equation (in which the motion is analyzed into infinitesimal steps) but from an integral which depends upon the whole trajectory over a finite period of time. This integral is called a Lagrangian, and the variation principle approaches motion as if a particle were attempting to "minimize its Lagrangian." The motion of a particle, in this approach, depends upon a whole period of time, rather than, as suggested by Newton, upon a succession of instantaneous mechanical reactions to an external force. The Hamilton-Jacobi theory is, therefore, determined by something that approaches teleology; it appears as if all motion is governed by the need to attain an "end."

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[4] Bohm, David and Peat, F. David, 1987. *Science, Order and Creativity*. New York: Bantam Books.

Bohm and Peat go on to say that the implications of the Hamilton-Jacobi theory may "lead to fruitful new insights into the age-old question as to whether or not there is a teleology in nature and if so, what it means." Teleologists look for evidence of a design and purpose in nature.

Newton's approach to motion is that of a succession of steps where each stage follows continuously from the preceding one, allowing motion to be analyzed through a succession of reactions. Newton accomplishes this analysis of motion by placing position (arrival) on the object while it is in motion (departure). The succession of steps and reactions is accomplished by having position always a part of motion. This is necessary to understand motion and its changes at any given moment. However, as has been said, Newton's "positions" are *assumed* positions and not actual positions for the object in motion. The reality of motion is distorted when we say, "when the object was here, here and here during motion, this explains its motion." Instead, this distortion of motion is replaced by, "if the object *had been* here, here and here during motion this would be the result" — the same result with a different explanation of causality.

The variation principle takes the trajectory of motion over a whole period of time. From past discussions this means a time occurrence at the beginning of motion to a time occurrence at the end of motion. What is the difference between this and Newton's approach? The Lagrangian integral surrounds motion with position (time) instead of requiring position (time) to always be a part of motion. It differentiates the start of motion (emission) from a state of time (absorption) and the end of motion when reaching another state of time (absorption). Newton however, always uses time (position) as a part of motion. The Lagrangian integral shows the actual separation in nature between motion and position (time), with time occurring both before and after motion. A finite period of time is treated as a finite period for motion which can show motion's beginning from position (time) and its end by reaching a new position (time). Time surrounds motion at the start and end of motion. Newton always included position (time)

as a part of motion. However, motion and time (position) are separate entities in their occurrence. Motion is used to reach time (position) rather than time being continuously involved with motion.[5] The position (time) of absorption can be assumed during emission, but in actuality positional time has not yet occurred. The Lagrangian integral is unique because it separates positional time from motion by showing a whole (complete) finite period for motion. A whole (complete) period for motion occurs by the positional/time for the beginning of motion and the positional/time for the end of motion. The Lagrangian integral uses time as a positional notation to identify the start and stop of motion. This raises the question, why does motion start and stop — begin and end?

By separating emission (motion) from absorption (position), a new perspective of motion emerges: motion with a direction toward ends or goals. Instead of being simultaneous, the separation of position and momentum create the necessary difference for cause-and-effect relationships. The cause of motion is the reach for a new effect of *position.* In other words, the cause of emission is the reach for a new effect of *absorption.*

The Hamilton-Jacobi theory alludes to motion's attainment of an "end" (goal). The presence of a goal for motion can be derived because position is not introduced as a part of motion. According to the Hamiltion-Jacobi theory, the position required for the starts and stops of motion does not have to be simultaneous with motion. The true cause of motion has been obscured by Newton's differential equations in which there is no separation of the cause-and-effect stages of motion and position. *Cause* and *effect* always

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[5] As discussed in Chapter 8 on Time (1) and Nontime (0), a finite period of time in reality is a finite period of motion defined by the surrounding of motion with the position of time before and after motion. A finite period of motion refers to lengths of motion related to lengths of the earth's motion around the sun. Lengths of motion are possible only by motion's beginning and end represented by positional time. Newton's positional/time during motion is assumed position and is not simultaneous with motion.

include two sequential stages. Motion and position express cause and effect where the cause of motion is a reach for the effect of position, but by requiring motion and position to be simultaneous, physicists also require cause and effect to be simultaneous. This negates causality.

The Lagrangian integral of a whole finite period for motion cannot occur unless the limits of motion are present. The limiting factors for showing a finite path for motion are the beginning and the end of motion. These beginning and end limits are specific locations of position necessary for defining a specific period for the particle's motion. There are two holes involved: the hole that is exited for the beginning of motion and the hole that is entered for the end of motion. The goal of motion is to reach a new position. An explanation of motion will never be discovered as long as it is believed that position is a part of motion instead of position being the "purpose" of motion.

There you have it: the *why* of human motion is related to the *purpose* of human motion. Why is there human motion? To accomplish the purpose of a successful arrival and its enjoyment. We use motion to arrive for the filling of our internal and external spaces with the physicals of choice. We move our space to the physical of choice or we move the physical of choice to our space. These successful filling events become the source of happiness.

Some may ask, "Is this all there is to the purpose of life?" Determining the destination and finding a path to reach that destination is the essence of all human challenges. Success, achievement and fulfillment are all reached through the completion of the journey. The ending of a successful journey adds the necessary knowledge (position) to undertake another journey. Continuing success enhances our self-confidence and encourages us to seek and find greater adventures. *Positional absorption for the human body is the purpose of human life and the motion of energy is the means to this end.* All the energy in nature is directed toward this goal. The direction of motion/energy for reaching position is provided by the forces of attraction and repulsion.

The rewards associated with reaching destinations are not the dull and repetitive daily journeys that often confront us. But these same journeys were once important and exciting moments when these motion-to-position events were first accomplished. The excitement of life is in finding and taking new paths toward new goals. The trodden paths can become boring and uneventful. Excitement follows the unexpected events of attempting new directions. The energy acquired and used for building and traveling on new roads represents the price paid for reaching the life event of position. The price of energy is in the production of energy and the effort required for its use in solving problems during the journey. One of the great human challenges is for us is to become galactic absorbers. The motivation for all human action is to fill our spaces for the attainment of human goals. Universal action involves the energy used in reaching absorption. The human mind first establishes mental position (knowledge) and then the mind commands the body's motion for physical position. The adventures of life spring from new motion-to-position events. This concept of universal purpose provides enough meaning — at least for me — for identifying the purpose of life.

The attraction force between humans and nature is for human individuals to have their holes filled. Human success is to fill other spaces so our spaces can be filled. To survive, we enter other spaces so our spaces can be entered. We provide love (fill) for others so we can be loved (filled) by others, we occupy to be occupied, we communicate to receive communication, we give to receive, we provide value to receive value, we sow new life to reap new life, we originate a positive fill for others to receive a positive fill for ourselves, we provide absorption to be an absorber, we become a creator to receive creation, we supply position to gain position, we produce goods and services to receive goods and services, we create solutions for others to receive solutions from others.

Furnishing fills for others to receive fills from others is how people endure as a civilization. It is always possible to take something without giving something in return, but this leads to destruc-

tion. A durable human species and a durable civilization must create an endless series of mutually valuable exchanges: value given for value received. To gain an effective positive (fill) a positive must also be given. It is the marketplace that provides these exchanges necessary for human survival. When an individual allows someone or something else to reach absorption, then he can become an absorber. We provide life to receive life. It is through the existence of negatives that the positives of the marketplace are developed. Without negative problems, there are no positive solutions to sell in the open market. The problems (0) of life are essential for creating and selling solutions (1) in the marketplace. If problems ceased, the positional goals of life's challenges would also cease. If there are no challenges, all the solutions are already known. The effort involved in problem solving gives value to life. The market sells solutions. Without the presence of the difficult, uncontrollable and unmanageable conditions of life, how can the easy, controllable and manageable conditions become a part of life? When losses occur, it stimulates the demand for solutions to remove these losses. The knowledge of preventing future losses is the gain produced from losses. Solutions are traded in the marketplace so that people can solve the problems to regain the control necessary for their survival. If you pay me for my solution to your problem, I gain the means to purchase solutions to my problem. In the continuing market, we solve more and more problems, allowing us to take on greater and greater challenges (problems). The greater the loss (problem) the greater the possible gain (solution). The 0 is always the problem and *how* to fill the 0 is always the solution. The 0 is infinite in its capacity to create problems. There will always be the challenges of perpetual problems leading to solutions.

There have always been those who have insisted on seizing solutions without providing them. Such unilateral gains can be made on a large scale through war or on a small scale through individual theft. In either case, value is taken without providing it. This creates a problem, but not for the one who has confiscated the solution (property). Who has the problem: the one who has

confiscated the property or the one who lost his property? The producer of value (solutions) who has lost his property has the problem. When theft occurs, the thief has created a solution for himself. The victim by allowing his property to be seized has contributed to a problem for himself. Over time, if there are too many takers of value from too many victims, there will be no more taking because there will be no more value (property) left to take. In the end, this results in the demise of humans and their civilization. Historically, the fault has focused on the thieves who steal value without exchanging value. The fault has been misdirected: it lies with those who are unable to protect their valuables (property). A responsibility always goes with ownership. Ownership means that the owner must assume the responsibility for the retention and maintenance of his property. It is "yours" to enjoy only if you can keep it safely in your possession. The thief does not have the problem; the victim who has lost his solutions (goods and services) has the problem. The removal of the problem of theft begins with the victim's creation of a solution to prevent this unilateral confiscation of his created wealth. It is incumbent upon the one who has the problem to solve it. When solved, the solution can be sold in the market to provide solutions for others. The problems generated by theft can be approached as either an opportunity to solve a problem or by sitting back and waiting for the thieves to stop stealing. Every problem can be treated as a challenge and an opportunity for one's own development and advancement in search of solutions. Taking and successfully meeting the challenge is the reason for human evolution. Without continuing the problem-solving process, human evolution will cease. Individuals cannot solve every problem, but the market can allow the purchase of solutions for those unsolved problems. It is important to emphasize that the existence of human problems allows the existence of human solutions which result in the advancement and survival of the species. Problems are losing situations necessary to the development of solutions that bring winning situations. Humans must continue to be involved in the

endless cycle of both *losing* and *winning* to gain the ongoing challenges necessary for progress and survival.

Selfish motivation is the process for the individual self to reach a filling and absorbing process. This may appear to many to be a selfish act. Many people believe selfishness is a deplorable human trait. But the necessity of a marketplace to attain high quality living and long-term survival indicates that the selfish desires of human absorption must be accompanied by providing absorption for something or someone else. To be selfish in an effective way is to also provide selfish situations for others. The market creates this situation through the trading of selfish desires. Without a selfish nature, humans would not exist. The ability to coexist is a direct result of the selfish acts of creating value for ourselves and then using this value to trade for the value generated by the selfish acts of others. All value arises from the effort involved in self-created problems leading to self-created-solutions.

Truly successful people, of necessity, create success for others and are part of the success of others. Within the selfishness of others, there is value provided to others. True success comes from exchanging the value of solutions — yours for theirs. It is not a one-way flow. Those who build meaningful lives for themselves will of necessity add meaning to the lives of others. Long-term success in our time requires one person's success to be part of another person's success. Self-motivation includes the spin-off of motivating others. Perhaps the concept of selfish should be redefined. Selfish acts of providing solutions for ourselves can become market products which in turn are purchased to become selfish products for the solutions of others. The market facilitates reaching good through bad and creating winning conditions out of losing conditions. The market provides a measure of value by revealing what will work and what will not work. The market becomes the basis for a successful and progressive society.

The opposite of this selfishness (1) is unselfishness (0). Unselfishness leads to the nonaccomplishment of selfish desires. To not effect absorption for oneself leaves one in an empty state unable to gain value (1) through exchanging with others. The inability to

fill oneself leads to the "death" (0) of oneself while living. To have and enjoy life is to live for oneself. It is impossible to live for others because to experience life events is to fill one's own spaces that are part of oneself. A life event means accomplishing a fill for yourself. To rely on others for life (1) without returning life is a contradiction because in reality it increases a form of "death" (0) while alive. This is a negation of absorption for oneself. To receive value without returning value is to negate life. To be able to return value indicates self-effort in filling your own spaces through solving your own problems. Even in the final stages of "old age," one must absorb and fill his internal spaces with food and air. Life is the ability to oscillate to the stage of absorption. Following the binary principle of opposites: selfishness (1) is a positive and nonselfishness (0) is a negative.[6] All humans oscillate between the selfish state of success and the nonselfish state of failure. The inability to reach the selfish condition of the fill only becomes a survival threat by not replacing it with the solution and the ability to fill. This redefines the popular concept of selfishness and unselfishness. Selfishness is a successful fill for one's self and nonselfishness is an unsuccessful fill for one's self.

Those acts where someone only gives to others may appear to be nonselfish. But in such cases, the giver is also the receiver. The enjoyment of giving comes from a selfish motivation. Humans live to enjoy the gain of spatial fulfillment. It may appear that some others live to inflict pain upon themselves, but in some way their final goal is to gain spatial fulfillment. For many, the selfish gain of mental rewards is sufficient spatial fulfillment. Selfish motivation is to reach a fill for oneself; however, the fills necessary for human survival are those successful fills for oneself that also provide successful fills for others.

This prescribes a foundation for individual and societal success. Those who attack lives and property of others attempt to *fill*

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[6] For the purpose of symmetry, *nonselfishness* is used here in place of the common term: unselfishness.

themselves by *emptying* others. The marketplace comprises positive-for-positive exchanges. The thief (destroyer) operating outside the marketplace gains a positive by imposing a negative upon others. But this negative loss can lead to a positive gain if the negative problem is used to arrive at a new positive solution. In other words, imposed negatives provide the motivation to find useful positives. Humans will continue to survive if they can convert wrong directions into reaching right directions. *Right directions* follow the paths that lead to the filling of the holes of choice. *Wrong directions* follow the paths that cannot lead to the filling of the holes of choice. If human perfection were to be reached by following only "right" (perfect) directions to the hole of choice, no new products would be necessary and therefore the marketplace would be unnecessary. Without problems to solve, we lose new directions, challenges and purpose.

This new interpretation of nature has been presented as concisely as possible. The final test of an idea's value in the long run is its usefulness. For myself this binary approach to understanding reality has been especially useful. It has been invaluable in forming my attitudes in how to approach and explain difficult problems. Individuals revolve around the cyclic events of summer (1) and winter (0). An earth without winter is an earth without summer and the metaphor is extendible to human cycles of "winters" and "summers." This is reminiscent of the words of the influential American writer Thomas Paine. Paine's *Crisis Papers*[7] became a profound source of inspiration for both the leaders and followers of the American Revolution to complete the revolution and expel British authorities from the colonies. It was a critical time for the beginning stages of what was to become the United States of America. The first *Crisis Papers* were read by officers to soldiers in their ranks prior to the successful winter battle at Trenton, New Jersey:

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[7] Foner, Philip S., 1969. *The Complete Writings of Thomas Paine, volume 1*. New York: Citadel Press. Page 50.

> These are the times that try men's souls. The summer soldier and the sunshine patriot will, in this crisis, shrink from the service of his country; but he that stands it now, deserves the love and thanks of man and woman. Tyranny, like hell, is not easily conquered; Yet we have this consolation with us, that the harder the conflict the more glorious the triumph: what we obtain too cheap we esteem too lightly; 'tis dearness only that gives everything its value. Heaven knows how to put a proper price upon its goods; and it would be strange indeed if so celestial an article as freedom should not be highly rated.

As the crisis papers were propelling the revolution, the American Colonies were in a state of Yin. The empty phase was at its pinnacle. Paine with his masterful metaphors demonstrated that the Yin (0) of winter was necessary to reach the Yang (1)[8] of summer; that tyranny, hell and the trying of souls is prerequisite to freedom, heaven, peace and the tranquillity of the soul; that the harder it is to obtain something the greater the reward upon attainment; that the price of the *good* things of life is paid for with the *bad*; that the easier it is to get something, the less value we place upon it; that failure is a prior condition to success and weakness must come before strength; that the greater the darkness, winter and cold, the more intense the sunshine, summer and warmth; that the more pronounced the empty of the Yin the more profound the fullness of the Yang; and the greater the agony of emission the greater the ecstasy of absorption.

Summer soldiering and sunshine patriotism is the rule. Humans tend to always want the good times. But nature does not work that way. The winter of Yin (0) is a requirement for the summer of Yang (1). If the adversities of winter are ignored it can destroy us. The winter of problems is nature's design for the summer of solutions. Survival goes to those who respond to the bad by reaching the *good*. This is nature's way. The trying times in our

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[8] For a discussion of Yin and Yang, see Chapter 13.

lives are empties (0) available for reaching the fills (1). The emptiness of winter makes possible the fullness of summer.

The philosophy of binary opposites is aimed at unifying human action and natural phenomena. An integration of science and biological processes is necessary for demonstrating a better approximation of nature's reality. Adherence to the scientific method and its predictions has given me convincing evidence that the philosophy of binary (0-and-1) opposites is correct. I will follow this course as long as the predictions of natural phenomena continue to hold true to observation. For human survival, investigations of the world must be ongoing. The limits of knowledge can never be reached and a move in the "wrong" direction can always be part of finding the "right" direction. And the purpose of finding a correct path is to reach a better path.

In conclusion, I will make a few final statements about gravitation and the importance of Einstein's General Theory of Relativity. His theory is an elegant mathematical expression of gravity. In *The Tao of Physics*[9], the physicist Fritjof Capra provides one of the clearest statements I have seen on the General Theory of Relativity. It goes right to the heart of what gravity represents:

> Matter and empty space — the full and the void — were the two fundamentally distinct concepts on which the atomism of Democritus and of Newton was based. In general relativity, these two concepts can no longer be separated. Wherever there is a massive body, there will also be a gravitational field, and this field will manifest itself as the curvature of the space surrounding that body. We must not think, however, that the field fills the space and "curves" it. The two cannot be distinguished; the field is the curved space. In general relativity, the gravitational field and structure — or geometry — of space are identical. They are represented in Einstein's field equations by one and the same mathematical quantity. In Einstein's theory, then, matter cannot be separated from its field of gravity, and the field of gravity cannot be separated from the curved space. Matter and space are thus

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[9] Capra, Fritjof, 1975. *The Tao of Physics*. Berkeley, California: Shambhala. Page 208.

> seen to be inseparable and interdependent parts of a single whole.

Everything in this treatise aims to integrate and extend the matter (1) and space (0) that is expressed in the General Theory of Relativity to all of nature. Furthermore, the aim has been to identify this duality (0-and-1) by revealing its broader significance as it applies to natural processes and human action. The binary nature of the interdependency of the 0-and-1 forms the root source of the evolution of these ideas. Einstein's General Theory of Relativity identifies mass (1) and space (0) as interdependent parts of a single whole. General Relativity as a theory embodies a unifying and integrative approach to nature.

After the General Theory of Relativity, Einstein spent his remaining days attempting to unify gravity and electromagnetism. Unfortunately, Einstein never accomplished this preeminent task. I believe that the unification of nature is implicit within the General Theory of Relativity. Once this is understood, the next large step is to apply this unifying principle of matter (1) and space (0) to everything in the microcosm and macrocosm. This binary application can be extended to all realms of nature. First it is necessary to remove the apparent and limiting view that gravity only involves large bodies and their association with large spaces. All objects are joined together by the mass that organizes and utilizes the space inside and outside those bodies. Mass organizes space to fill space. Gravity is an expression of the matter (1) and anti-matter (0) states of all objects including objects inside the bodies of stellar systems. The geometry of space outside these large bodies is an extension of the geometry of the space inside these bodies. The gravitational attraction between large bodies (planets, stars and galaxies) is derived from and originates from all the similar 1s and 0s that form the microcosmic makeup of these massive objects.

When Theodor Kaluza added a fifth dimension to the General Theory of Relativity, both gravity and electromagnetism appeared in his equations. This is a powerful statement that the microcosm within the macrocosm of gravity also has a 0-and-1 foundation.

The General Theory of Relativity expresses the principle behind the unification of the universe. Einstein's introduction of the geometry of space is the key for determining why matter is induced to have motion and reach position. With the understanding that mass (1) is always coupled to its spatial (0) field, great advancements in science will follow. The enhanced awareness of the nature of the binary universe will provoke immense social and technological change. This integration will lead to resolving present difficulties in mathematical interpretations — for example, Schrödinger's wave function.

All motion is an attraction force between 0s and 1s that is directed by a repulsion force. The same attraction and repulsion that causes the motion of planets and stars also causes human motion. The force of repulsion (0-on-0 and 1-on-1) has always been coupled with gravity's attraction (0-to-1 and 1-to-0). Humans on the surface of the earth are continually involved with the repulsion and attraction of mass. Inertial mass and its resistance (repulsion) to motion is the same mass involved with gravity. Gravitational mass and its attraction to its field (0) are coupled with inertial mass and its repulsion to the mass of other objects. They work together and are dependent upon each other. For humans and all objects, the inertial force of repulsion is required for using the attraction force of gravity. The inertial force, as a repulsion force, involves inertial mass (1) and inertial nonmass (0). Inertial mass is the more apparent 1-on-1 of mass and the inertial nonmass is the less apparent 0-on-0 of nonmass. When discussing inertial mass it should be understood that inertial nonmass is also involved. Of necessity, all objects are a composite of both mass (1) and nonmass (0). The inertia of repulsion is always a copartner of the attraction force.

Newton's F = ma (force equals mass times acceleration) shows the relationship of the two forces of repulsion and attraction. The *m* in the equation represents inertial mass using the force of repulsion to reach the *a* of acceleration due to the attraction force. Mass has two components, its initial inertia of the repulsion force followed by its acceleration in response to the attraction force.

Mass uses its repulsive force of inertia to transfer motion/energy from the mass of one object to another. Repulsion (where mass cannot go, 1-on-1) is used to input energy for the 1-to-0 attraction force where mass can go. The resistance of mass to motion provides input motion (energy) transferring energy to output motion. Input (motion's arrival) is through the force of repulsion and output (motion's departure) is through the force of attraction. Inertial mass provides repulsion for its gravitational mass to respond by motion through its gravitational field (0). Mass at rest is "helpless" in responding to attraction — through energy input leading to energy output — unless mass also uses its inertial repulsion force. Mass is involved in two ways: one is with itself (1-on-1) in repulsion (inertial mass) and the other is with its attraction to its field (0). Repulsion stops motion for the mass of objects, allowing this energy of motion to transfer to other objects in its reach for position.

As we stand on earth, the gravitational force attempts to pull us to the earth's center, and the resistance to this is the 0-on-0 and 1-on-1 of repulsion — our mass (1) in opposition to the earth's mass (1) and our nonmass (0) in opposition to the earth's nonmass (0). Human skeletal and muscle structures have evolved to adapt to this repulsion. Attraction and repulsion are opposite forces that always depend upon each other. Biological forms require repulsion to "show" them where they cannot go in reaching the attraction of where they can go. The change of direction by any object is dependent upon repulsion and attraction forces. The path is determined and the journey starts through the use of both forces. The destination (hole of arrival) is determined and the journey is terminated through the use of both forces. The 0 of where we can move is seen through the 1 of where we cannot move. The 1 of where we cannot move is also used to contain the 1 of us for arrival. Both forces are used to measure our weight. Gravitational attraction pulling at us and repulsion's resistance create the pressure that causes a weight scale to measure weight.

Why are astronauts weightless in space? What is different about an astronaut's weight in space compared to his weight on

the surface of the earth? In outer space, astronauts have reached the motion (energy) that gravity's attraction force is attempting to produce at the surface of the earth. On the earth's surface this attraction force pulls us toward the center of the earth. In space, the astronaut's motion around the earth would be like falling down a tunnel (hole) toward the center of the earth. To float in orbit around the earth is to fall around the earth. The weightlessness of astronauts in space is not caused by canceling the gravitational effects upon them, it is caused by canceling the direct effects of the repulsion force preventing motion. Motion in orbit is reaching toward the effects of gravitational attraction. There is no longer a repulsive resistance to motion in attempting to reach position (center of the earth). In orbit, the gravitational attraction force has started the emission stage of motion for reaching a positional state of absorption. The orbiting astronauts have been removed from the earth's mass (1) and nonmass (0) and their direct encounter with the inertial force of repulsion. Instead of canceling gravitational effects, being in orbit cancels the direct effects of earth's repulsion that prevent motion. Once orbit is reached, direct contact with repulsion is replaced by the motional emission stage of attraction (gravity). However, motion is still guided by the indirect force of repulsion at a distance.

Note that astronauts use their own attraction force in moving into outer space in opposition to the gravitational attraction. Gravity's attraction force pulls them toward the center of the earth and the astronauts' attraction force pulls them toward holes above the surface of the earth. The individual atoms of the human body "want" to move in one direction and the individual person "wants" to move in another direction. The 1s and 0s of atoms — people's atoms and earth's atoms — are attracted to each other while the human body's 0s and 1s are attracted to the 1s and 0s of outer space. The attraction forces of nature depend upon structure and what that structure's 0s and 1s are designed to absorb and emit. Atomic structures have their 0s and 1s and human structures have their 0s and 1s.

To reach holes on the surface and above the surface of the earth, astronauts use repulsion to provide motion. Newton's third law of motion is involved with this inertial resistance of mass (1) on mass (1) and nonmass (0) on nonmass (0) and is the first step to the beginning of motion. A propeller beneath the water's surface propels our vessel along a spatial path surrounded by water. Thrust is provided by the inertia of repulsion between the mass (1) of the propeller and the mass (1) of water as well as the repulsion of the nonmass (0) of propeller and the nonmass (0) of water. In my discussion of inertial mass, it must always include inertial nonmass as a part of repulsion. Water is pushed backwards because it cannot occupy the propeller. The water in turn pushes the propeller, and consequently the vessel forward because the propeller cannot occupy the water. The engine's energy (motion) has been transferred, through repulsion, to both the water and the vessel. This is a series of energy outputs (emission) by the engine to energy inputs (absorption) to the vessel and the water.

The airplane's propeller operates on the same principle except that it acts upon the molecules of air instead of the molecules of water. The spinning of the propeller develops a force of repulsion (0-on-0 and 1-on-1 of both propeller and air molecules) against the air molecules and conversely, the air molecules against the propeller. The air molecules are pushed behind the airplane by the repulsive force of the propeller. At the same time, the air molecules repulse the propeller pushing it forward along with the attached airplane. The propeller's motion (energy) is transferred through repulsion to the motion of air molecules and the airplane. This is another example of F = ma, where the inertia of the repulsion force (0-on-0 and 1-on-1) is necessary to produce the acceleration (motion) used by the attraction force (1 to 0). F = ma demonstrates the unification of the two forces of repulsion and attraction. *Force* in nature always involves attraction and repulsion.

The astronaut's liftoff (motion) is launched by the energy (motion) flow of the ignited rocket fuel. The burning fuel's mole-

cules are thrust backwards and out the open exhaust nozzles of the rocket ship's engines. As burning fuel is thrust backward and out of the engines the thrust pushes the rocket ship forward. The rocket ship pushes against the burning fuel and burning fuel pushes against the rocket ship. The motion of the burning fuel is transferred into forward motion of the rocket ship through repulsion. The fuel's motion is directed to where it *can go* because of where it *cannot go* and the motion of the rocket ship is directed to where it *can go* through the repulsion of the burning fuel. Two holes are necessary to direct the motion of the burning fuel and the motion of the rocket ship. These holes represent the space above the rocket ship and the space below the rocket ship.

The dynamics of motion through attraction must always be preceded by repulsion. Our ability to stand on the earth is the result of repulsion preventing gravitational attraction from pulling us to the center of the earth. Humans use the repulsion of where they cannot go to propel them (by attraction) to their holes of choice where they can go.

The orbital motion of astronauts is the stage of emission which continues through gravitational attraction. The moon's and the rocket ship's orbital motion are gravity's "attempt" to reach a position at the center of the earth. The planets have this same stage of emission, but it is directed toward the center of the sun. The sun also moves within the galaxy because of its attraction toward the center of the galaxy. Galaxies move around their common centers of attraction. All motion is directed toward a positional goal. Repulsion is the guide for motion's attraction. The paths of motion for all objects are repelled by where they cannot go and thereby directed to where they can go (attraction).

For repulsion inside the spacecraft, the astronaut requires the 0-and-1 of the spacecraft's body to oppose the 0-and-1 of the astronaut's body. It is a form of repulsion whenever one object is used to redirect the motion of another object. Every push from where we cannot go produces pressure upon ourselves and the object pushed. In outer space, a weight scale would register weight if an astronaut used it to push off to change directions.

The pressure we measure as weight is the force of attraction "wanting" to reach motion and the force of repulsion due to the 0-on-0 and the 1-on-1 resistance preventing motion. Repulsion enables us to transfer energy (motion) at different rates in different directions.

Inside the rocket ship, the motion of the attraction force for humans is simultaneous with the orbital motion of the gravitational attraction force. Two separate motions take place with their separate attractions. Motion due to humans and motion due to gravity have a separate attraction force leading to their respective motions (emission). Human motion and gravitational motion both respond to an attraction between 0s and 1s. The astronaut (1) fills the 0s of the rocket ship so the 1s of the rocket ship can fill the 0s of the astronaut.

The repulsion force is always around us and is part of the gravitational force of attraction. All resistance is a form of repulsion used through direct contact or a response at a distance. Repulsion is used by all forms of attraction in directing and transferring motion/energy. The use of gravity's force of attraction by humans and by stars and planets would be impossible without the force of repulsion. The impossible of repulsion is used to reach the possible of attraction.

Einstein recognized the necessity of a repulsion force and, therefore, added the "cosmological constant" to the General Theory of Relativity. This repulsive force was used to explain the balance and maintenance of what was believed to be — at the beginning of the twentieth century — a static universe. It was discovered later that the universe is not static, but is expanding and does not require the inclusion of a cosmological constant. Einstein was not happy with his introduction of the cosmological constant. Nevertheless, the gravitational force of attraction cannot be operational without the force of repulsion. It is difficult to imagine a world of attraction without repulsion. The relationship between human action and repulsion has been shown. In recent developments of physics in the late twentieth century, the cosmological constant has resurfaced in new mathematical models. I anticipate

that future cosmologists will include repulsion as an integral part of all universal action. The Doppler effect was used to change our view of a static to an expanding universe. Currently there are serious questions about the Doppler effect representing the major explanation of the redshift. The redshift represents an increase in the wavelength of light with increasing distances. A shift toward the red means a shift toward longer wavelengths and lower frequencies. By incorporating the 0-and-1 into wave theory, it may be possible to show that distance without expansion can also account for the redshift. Diffraction and the absorption of light (1) over great spatial (0) distances may itself cause an increase in wavelength. The Doppler effect with its expanding universe may not be the only way to explain this universal increasing redshift with distance. When the 0 becomes an integral part of all our observations, we can make the next leap forward in approximating reality.

Understanding the repulsive relationship of anti-matter (0) on anti-matter (0) and matter (1) on matter (1) is the key to using repulsion to direct and transfer emission (energy) to absorption. This involves redirecting the internal energy used by atomic matter and anti-matter to human use of human matter and anti-matter. The present usage of electromagnetism is a narrow application of atomic energy. Recognizing the effective role of the 0 in all human endeavors is a grand solution to continuing human progress.

Let us now take a few opposites that seem to be more important to us and see if this binary principle can give us a better understanding of opposites as they apply to human action.

CHAPTER 12

FREEDOM (1) AND SLAVERY (0), LIFE (1) AND DEATH (0)

HUMAN *FREEDOM (1)* REPRESENTS the success of the 1 in using the 0 through the force of repulsion and attraction. When emission and motion for people are successful in reaching absorption, they have freedom. Freedom is the use of human action in filling human space with the physical 1 of choice.

Human *slavery (0)* is the failure to use the 1 and 0 successfully in reaching absorption. Slavery means repulsion is not used as an effective guide for attraction to proceed. The 1-and-0 of people who are enslaved have reached 1-on-1 and 0-on-0 encounters. They lack the ability for attraction (0-to-1 and 1-to-0) to proceed with emission reaching absorption. Slavery (0) is human inaction in not filling human space with the physical 1 of choice.

Contrary to popular opinion, slavery (0) is a necessary prerequisite of freedom (1). The condition of slavery prompts us to learn and achieve the knowledge to attain freedom. Repulsion and not being able to be where we want can result in gaining the knowledge that reveals the

motion necessary to arrive at freedom. The 0 of slavery is necessary before it can be filled by the 1 of freedom.

Slavery can threaten our existence, depending upon the time it takes to achieve freedom. Some states of slavery are more important to replace right away with a free state. From past applications of slavery we can gain the necessary knowledge to replace slavery with freedom. As with all opposites, having only one or the other results in not having either. The 0 of slavery and the 1 of freedom define each other and require each other for their antonymic existence.

Each political state has its own laws aimed at controlling the conduct of human beings with respect to each other. Each nation's political leadership claims that the purpose and goal of its political law is to establish freedom for all and to create a society where freedom eliminates the impediments and infringements to human progress and achievement. Each leadership seeks a condition where only the good and the positive are meant to dominate.

Political leadership alleges to have the best way to accomplish political aim. And millions of human beings have been killed by those who are convinced their political plan will produce heaven on earth. They have claimed that the death of many is a small price to pay for the eventual freedom of many more in the best of all possible worlds.

Freedom is not free. We have failed to recognize that the only way we can reach freedom is through impediments, coercion, controls, infringements, and some form of slavery. Freedom does not, has not and will not ever exist without the contrast of its antonymic opposite slavery. To have exclusive freedom or exclusive slavery is to have neither. The 0 of slavery represents the empty of human spaces required to fill them with the 1 of freedom.

The term slavery as used here is not limited in usage to man enslaving man. To be *enslaved* is to be unable to reach your destination through motion. There are in nature many factors that temporarily or permanently *enslave* us, regardless of the actions of others. The impediment of a boulder blocking our progress on the road leads to our *enslavement.* We have actually enslaved our-

selves by setting our course — unknowingly — toward an "immovable" object (1 of car meets 1 of boulder), in this case a twenty-ton boulder. This is as much an enslavement process as if a person were blocking our passage. The boulder as well as humans can prevent an individual's spaces from being filled. Nature creates many slave conditions. All human progress comes from replacing what stops and impedes his and her progress. Human inability leads to ability. Where man cannot go leads him to where he can go. The contrast of slavery (0) is the vehicle to freedom (1), and the contrast of obstacles is the vehicle to progress.

There are enough challenges in coping with nature against man without the challenges of coping with man against man. Learning to live in harmony with humans will give us more time to deal with *nature's slavery* that prevents us from exploring the galaxy. If we can enjoy the freedoms derived from getting along together, we can move on to address new forms of nature's slavery. The solution lies in using the slave condition — that follows the inefficient use of repulsion — to reach freedom that follows the efficient use of repulsion. We must learn to use repulsion to reach attraction and new freedoms so we can spring from another new repulsion (slavery) to another new freedom. If humans survive, this cycle does not end.

Our social problems are of value only if we replace them with solutions. Slavery (0) can be of value only if we replace it with freedom (1). Nature may dismiss us at any moment if we do not reach solutions to the problems of man's conduct toward man and toward his environment. The longer problems (repulsion) remain, the more difficult and threatening they become. Slavery in some form (problems) must always exist; however, their continued presence — repeating the same slave states — affects our survival capabilities. For human survival there must be continuing oscillations where the 0 of slave states are displaced (replaced) by the 1 of freedom states. These 0 to 1 oscillations must have the proper frequency for survival.

Ignorance (0) is the part of slavery (0) that leads to knowledge (1) and freedom (1). If we remain ignorant, slavery can destroy us. The oscillation between slavery and freedom is an ongoing process. The idea may disturb some, but the 1 of freedom's arrival can only be reached through the 0 of slavery and the opposite state of not being free. To retain slavery is to turn off motion to arrival events as a switch turns from the on (1) to off (0); reaching freedom turns on motion to arrival events as a switch turns from off (0) to on (1). As in all switches there is no *on* without an *off* or *off* without an *on* (see corollary #9). The 0 of the *off* of slavery is necessary for the 1 of the *on* of freedom and the 1 of the *on* of freedom is necessary for another *off* of the 0 of slavery. The universe pulsates between off-and-on, 0-and-1 fluctuations.

In dictionary usage *freedom* is the lack of coercion or constraints in the choice of action. The antonym *slavery* is the presence of coercion and constraints preventing the choice of action. And action is the process of emission-to-absorption. Action is the dynamics of attraction using repulsion in enabling the 1 to use the 0. Notice that the terms coercion, constraints and control are used to define freedom. This is an example of how opposites define each other. Without these negative terms how can we define the positive term of freedom and conversely? As has been stressed the positive concept of freedom is not possible without the negative concept of slavery.

The degree of freedom you have had and will have depends on your successful arrivals from your successful departures. The reason one person's freedom will be different from another person's freedom is that one chooses to fill their space differently. If you have achieved a great many states of freedom, it means that you have also gone through many states of slavery. They are the price, the dues we pay in life to enjoy the benefits that flow from a state of freedom. All the negative connotations in our lives, which may include struggle, failure, frustration and disappointment, are part of these "slave" states that are necessary pathways to positive opposites.

We must avoid putting ourselves in a slave state from which we cannot escape. This is the value of the long-term view. The long-term view allows us to see how these repulsion effects can have influence upon us far into the future. A "short-termer" is one who does not look beyond the results of the next action (emission to absorption).

To be always in a state of freedom is to be always in a state of perfection which is unattainable. To move from the state of slavery to the state of freedom is the challenge of life. If we knew how to be everywhere at all times, there would be no reason to exist. The reason we create goals and challenges is to encourage the action necessary to reach them. Not being at the arrival stage of freedom is prerequisite to the arrival of freedom. Freedom arrives in individual chunks of the successful occupation of human space. In between these freedom chunks are individual chunks of slavery. There is a continual series of imprisoned states with escape and freedom in between.

If humans do not enslave you, this does not mean you are free. Emigrants arriving in a "free country" after escaping from a slave-state very often bring their slavery with them. After being controlled by their masters, they are suddenly thrust into a society where they must make their own decisions and achieve their own freedoms. Until they can do this they are still slaves. You can unlock the prison doors but the doors will remain closed until the prisoner reaches the necessary acts of emission and absorption and opens them. You may be shown pathways (0) to freedom (1), but you must always walk the path (0) for your arrival (1) at your destination. It can be discouraging and even devastating to realize that you do not know how to create solutions for your survival. The victims of political paternalism may be crippled to the point where they may not be able to survive on their own. For them, the reality of what was thought to be freedom may turn into a nightmare. To be free is to possess the liberty to *attempt* to move from a problem to a solution, which includes the liberty to *attempt* to move from a slave state to a freedom state.

The challenge of parenting is to allow children the liberty to reach their own slave states from which they can learn to extricate themselves and reach their own freedom states. It takes courage to teach children survival techniques while protecting them from the hazards of non-survival situations. When over-protected children are not allowed to learn to remove the lesser slave states of youth, then as adults they may lack the skills to remove the greater slave states of adulthood. Would it be of value to teach our children that life is a series of problem-to-solution phases? The most valuable gifts parents can give their children are the tools to successfully move in and out of these off-and-on fluctuations.

Reason tells us that we would not know how to prevent coercion, controls and attacks without experiencing them. To know how to protect ourselves from such interferences adds to our ability to reach more freedom, but we would never know about the concept of protection without the slavery that necessitates that protection in the first place. The ability to protect comes from the inability to protect. We learn from the limitations of slavery on how to rid ourselves of limitations. We use our experiences with negatives to go on to create bigger and better positives. The slave condition creates the hardships of life. It is against the backdrop of the "hard" that we learn the meaning of the "easy." Not being there (no arrival) and being there (arrival) is this 0-and-1 oscillation. Slavery presents the problem of how we can fill the holes (0) of choice. Freedom is the displacement and removal of the 0 of slavery by the filling of the 1.

If some insist upon enslaving others as a means to attain their own liberty, then they cannot avoid the risks of such actions. Behind every solution lies the next problem and behind every problem lies the next solution. The problem confronting a slave may be temporarily solved through the termination of the slave master. By causing a problem for another person you place him in a position of having to solve that problem. It is a mistake to assume that those with problems created through others cannot solve them. A thief is the slave master of those from whom he

steals, but the thief augments the hazard of seriously enslaving himself; especially should he be caught, tried and jailed.

Whether it is humans or nature that enslaves us, slavery will continue to be a part of our existence. It is important that we do not always remain a part of the same slavery. When we keep repeating the same mistakes that lead to the same slavery we are stuck in the proverbial vicious circle. It is paramount to know that freedom is self-created. You endow it upon yourself. We have been created to be creators. To survive is to create freedoms for ourselves. This means we cannot wait for someone else to give us freedom. How often do people say, "If only someone would stop doing this to me I would be free"? In believing this one sets himself up to be enslaved. It is never someone else who gives you freedom. It is your own action, motivated by a repulsion from a state of slavery, that gives you freedom. By waiting without action the individual cuts himself off from going through emission to absorption. The proactive achiever uses enslavement as his guide to freedom.

Only the individual can determine how many freedoms he or she earns in life. The freedoms you have earned determine how you think of yourself today. Reaching a state of slavery can give us a purpose for learning how to extricate ourselves from this negative condition. Freedom can only be earned by the earner. A teacher may show you how to be free, but you must accomplish freedom for yourself through individual action.

In the Lawrence Sanders novel *The Marlow Chronicles,*[1] the protagonist, Marlow, asks his son,

> Who gave you any guarantees? The Declaration of Independence says you can pursue happiness; it doesn't say anything about catching it.

A greater state of happiness follows a greater state of freedom achieved through the successful arrival of our aims. We may fail to

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[1] Sanders, Lawrence. 1977. *The Marlow Chronicles*. New York: Putnam.

always find happiness through its pursuit (motion), but the pursuit is requisite to its attainment. The unhappiness (slavery) found in the effort, work, struggle and failure to solve problems creates the necessary contrasts that define happiness (freedom) and solutions. This awareness of contrasts can give us the courage to endure unhappiness in the present with the prospect of great happiness in the future, but there are no guarantees we can ever reach our goals. This gives meaning to the challenge. The magnitude of the successes and rewards in life is measured by the magnitude of the challenge. The greater the challenge, the greater the reward.

LIFE (1) AND DEATH (0)

The ability to experience comes from the ability to live. Living includes the experiences of both life and death. Having left the realm of the living, those who die cannot experience their own death. It is only the living who experience life and death. By introducing the 0 we can reach a better identification of life and death. How do we experience death while alive? As will be explained, during an individual's life, death comes from life and life comes from death. Life and freedom are derived from the 1 and death and slavery are derived from the 0. It is the contrast between pairs of opposites which allows definitions. Freedom (1) defines slavery (0) and slavery (0) defines freedom (1). Life (1) defines death (0) and death (0) defines life (1). The 1 defines the 0 and the 0 defines the 1. This interchangeable relationship between the 1 of life and the 1 of freedom and the 0 of death and the 0 of slavery — as well as all opposites — is created by the 0-and-1 base for all opposites.

Life (1) depends upon our action and success at using the forces of repulsion and attraction to reach the emission and absorption phases of choice. Life springs from the action leading to the success of filling our spaces. The 0 is displaced by the 1.

Death (0) involves our inaction and failure to utilize these two forces of attraction and repulsion to reach the emission and

absorption phases of choice. Death is the inaction that does not lead to the filling of our spaces. The 1 is not displaced by the 0.

What happens when those near and dear to us die? They continue to be dear but they are no longer near. While living, they brought life to us because we were able to move toward and reach an absorption with them. They fill our spaces as we fill their spaces. To absorb includes the act of being absorbed. A love that works is reciprocal because to love is part of the ability to be loved.

The root source of love can be found in one's ability to absorb through being absorbed. In such a case, I want to fill (1) your spaces (0) so I can fill (1) my spaces (0) and, conversely, you want to fill my spaces so I can fill your spaces. A reciprocal value is created. Love is a value-for-value exchange. You allow me to be where I want to be and simultaneously I allow you to be where you want to be. The 1s of each person use the 0s of each person to reach a fill for both persons. The 1s of each have displaced the 0s of each. When two friends embrace each other, the empty of each is filled. The physical of each other organizes the space next to each other and is filled by each other. The 0 of death for both has been replaced by the 1 of life for both.

Filling each other's spaces can be accomplished merely by looking at each other. Light particles (1) from each are absorbed by each with the adjacent nonlight (0) contrasting frame of reference.[2] This contrast creates the image of the person you are looking at. To look at each other is to absorb and be absorbed. You are absorbing my light while I am absorbing your light. To absorb each other is to receive the 1 of life from each other.

The death of a close friend throws the switch to a permanent and unfilled off. We can no longer switch to a filled on. Our expression of love is the value we place on being where we want to be (fill). Experiencing life and love with our friends is now lost through death. In death, only a 0 remains with the departure of

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[2] See Introduction – Corollary #2.

their organized 1s and 0s. We the living now have a 0-on-0 encounter of repulsion because with death (0), attraction (1-to-0 and 0-to-1) can no longer reach arrival. We have only the 0s of others to fill. Gone is the 1 of the deceased who provided the 0 we loved to fill. The apart (empty) phase can no longer reach the together phase (fill). Our 0s can never again be displaced by this important 1. And their 0s can never again be displaced by our 1s. When their special 1s are gone their special 0s are also gone. A life (1) experience for us is lost and replaced by death (0) because our 0s can never be filled again by the 1 of the deceased.

This is one form of a permanent death for us, but there are other forms of permanent and temporary death. The possibility for life to continue through absorption may exist, but humans commonly place impossible obstacles in life's way. Until we use the impossible to reach the possible, we experience a form of death. Depending upon our actions, death can last a lifetime or we can convert death to life when the problem (0) of obstacles is solved (1). A problem is a form of death (0) which is solved by the creation of life (1). Solutions then bring us life.

This is a deeper meaning behind life and death and how it relates to our lives than the common perception. This is another way of showing how all opposites are related. Opposites are the children of the universal binary source: 0-and-1.

Love is a value we place on the decisions we make to be where we want to be. Love and life are related because the love of arrival is what gives us life and is life. In contrast, we abhor the opposite of life and love: death and hate. Death and hate are the problems. Love and life are the solutions created out of these problems. The things we most dislike become the principal problems in our life. Problems are a form of death — obstacles we dislike — which are necessary opposites of life and love. Death and our dislikes are problems and obstacles on the path to life and love and the things we like. The force of repulsion is then against us; nevertheless, we use repulsion and the impossible in creating life and the possible. Death is a 0 that may be replaced with a 1 of life.

Most human problems do not need to be permanent. Death does not allow us to provide absorption (love and life) for ourselves and other objects. The impossible of death (problems) can be used to reach the possible of life (solutions). Most of the problems we experience are a temporary form of death rather than the permanent form in the death of a friend. Temporary forms of death are temporary because they can be transformed into life. If death is the inability and failure to absorb and be absorbed, then we can observe that most forms of death are problems that can be used to reach absorption (solutions). In this sense we spend our lives fluctuating between life (1) and death (0). This is another way to explain that life is a fill (1) and death is an empty (0) — the empty of death is necessary to attain the fill of life.

Not having a vehicle to get where we want is a form of death. When this is the case, we cannot reach an absorption event in gaining life and what we love. With effort and time, this form of death (0) can be transformed into life (1) by solving the problem of obtaining the necessary vehicle. There are parallels between the impact upon us when death denies us access to our loved ones and the impact upon us when we are denied access for any reason to other things we love. The inability to access any of the things we love is a form of death. Death is the 0 that is denied access to the 1 of life. Some may be permanent forms of death while others may be replaced with life. Permanent or temporary forms of death occur when access to absorption — the filling of our spaces — is permanently or temporarily inaccessible.

The marketplace is an example of the fluctuations of death and life, problems and solutions, hate and love. The market is composed of buyers and sellers. The sellers offer life, solutions and the things we like. The buyers are buying to eliminate the negatives of death, problems, and the things they dislike.

Why does the seller sell these solutions to the buyer? The prior existence of the negatives for the buyer motivates the seller to procure these positive solutions. The 0 of the buyer's negatives is necessary for the seller's procurement and sale of the positive 1. The seller recognizes that his success is based on solving the

problems of the buyer. The seller provides the 1 of the solution for the displacement of the buyer's 0 of the problem. Without the 0 of *death,* problems and the things we dislike, we would not have a marketplace to offer the 1 of solutions, *life* and the things we like. In fact we would not even have a civilization.

This simple principle states that a *stop* is necessary for a *start,* an *off* is necessary for an *on,* a *negative* is necessary for a *positive,* and a 0 is necessary for a 1. The buyer wants successful emission-to-absorption phases. The seller acts to procure the buyer's successes because selling them allows the seller to reach his solutions leading to his own successful emission and absorption phases.

The marketplace provides a value-for-value exchange which includes trading the things one trader values for the things another trader values. The buyer says, give me the solutions I value — usually in goods and services — and in exchange I will give you the money to purchase solutions that you value. Money is the medium of exchange to facilitate filling (1) present and future holes (0).

Earned money (not unearned) is a measure of man's progress toward successful emission and absorption. The value of earned money is a vessel for the storage of past solutions which can be used for the payment of future solutions. Within earned money is a reservoir of life that can be exchanged for new life. When money is earned it represents the solutions (life) we have provided for others. This earned money is then used to purchase life (solutions) for ourselves. Value remains part of money as long as it is backed by the creation of solutions (life). Money is a storage of the 1s of life that are used to replace the 0s of death. The loss of the value of money occurs when the 1 of solutions (life) is not a part of money. The marketplace is the field of exchange that enables people to facilitate life experiences of solutions through absorption. The marketplace allows death-to-life, problem-to-solution fluctuations.

The true heroes of society create these life and solution events. Everyone is involved in this process for their survival, but there are some whose efforts increase everyone's potential for

survival. Among these are scientists and technologists who have provided important solutions for a better life for greater numbers on our planet. Unfortunately, most people do not know why they are alive and where the value of their life has come from. Who are the great innovators who are primarily responsible for our lives and standard of living beyond subsistence? It is important to have a rational direction of thanks and gratitude for what we have. Would this understanding sensitize us to the value of the accomplishments that have led to the continuation of life? It is important to know the sources of the engines of civilization. This knowledge shows us what is worth protecting and building. And it gives us a positive direction for our own lives.

Without the operation of the marketplace, we would lose these death-to-life (problems-to-solutions) oscillations. More than this, we would lose our ability to experience anything. Experience represents these emptying (death) and filling (life) fluctuations. Life and death — problems and solutions — are experienced one after the other or not at all. We use death (0) to reach new forms of life (1) and life (1) to reach new forms of death (0).

Are the biological processes, of which we are a part, the only forms (structures) that are capable of having these death-and-life, empty-and-fill, negative-and-positive and emission-and-absorption processes? Consider the universe of atomic structures of which we are a part. Do these structures also fluctuate between death-and-life, empty-and-fill, negative-and-positive, emission-and-absorption?

Human methods of emission-and-absorption are unique, but does this mean that there cannot be other unique systems of emission-and-absorption? Let us consider the possibility of other unique systems of emission-and-absorption as having a life of their own. Can we consider all objects capable of these oscillations as having life? Are humans an extension of and a combination of an atomic universe that also oscillates between emission and absorption, empty and fill, death (0) and life (1)?

Who has the greater "intelligence," the builder or those who have been built? Who has the greater capacity for creation, the

builder or what is built? Have we been built by our underlying atomic combinations? Are we an extension of the emission and absorption principle that is also a part of atomic structure? Is the microcosm capable of organizing our structure with the same principles we use to organize the structures that are part of our civilization? If this is possible, perhaps we should look inward for a greater understanding of intelligence and life. Are we merely extensions of life forms that built us in the same way that cars, trucks and computers are extensions of our life forms? Have the builders of our structure built us to aid them in their life-and-death oscillations in the same way we build structures to aid us in our life-and-death oscillations? Do the builders of humans live within us as we live within our structured civilization? Is it possible that the greater intelligence lies within? Have objects within the realm of the subatomic domain designed and created us which has led to our designing and creating civilization? Perhaps the builders of the human structure represent intelligent life that emit and absorb within us as we in turn emit and absorb in the structures we have built. It is possible that advanced life forms have built us for their survival and evolutionary advancement as we must build for our survival and evolution.

I am hypothesizing that all creations derive from an infinite series of creators. Each creator is an extension of a previous creator. As a species, to continue our viability we must continue to become better and better creators. What we eventually build may some day be perceived as a separate entity in much the same way that we perceive ourselves as separate entities. But there can never be a complete separation, because each creator in turn is dependent upon its creator. Life continues to extend itself with each new creation.

We have been built for the same reason we build for ourselves. The driving force of nature is to oscillate *better and better* within the stages of emission and absorption. The universe is in a constant evolutionary building process for the purpose of emission and absorption. Humans are a small piece of this larger fluc-

tuating and pulsating process. It is all tied together with one structure as a part of the whole.

A solution always leads to other problems to be solved by other solutions. This is the basis for nature's constant building pattern. Those who cannot resolve problems with solutions make way for those who can. This is the essence of evolutionary biology and "survival of the fittest." Nature has its own built-in method of "quality control."

The creators that have created us, and remain a part of us, have created a continuous transformation of death into life. How long will humans last? Will we someday be the underlying and unseen creators of what may become a new life form? Are we already doing this through our building of civilization? Is the city a new form of life? A timely question is, can we develop a new life form that will be capable of interstellar emission and absorption events? If our species survives in time we may achieve a creation that exceeds our present imagination.

CHAPTER 13

Yin (0) and Yang (1), Male (1) and Female (0), Moral (1) and Nonmoral (0)

YIN AND YANG IS AN ANCIENT philosophy. From the earliest stirrings of Eastern thought, philosophers noticed the fluctuating nature of opposites. Yin and Yang are expressions of the two poles that form the basis of all opposites. They depend upon each other; to have one is to have involvement with the other. Chinese literature is replete with the idea that nature is both male and female, right and wrong, dark and light, good and evil, and so on to include all pairs of opposites. Eastern philosophers have understood the importance of reaching a balance between and being a part of both opposites. Both extremes must be experienced to know either extreme. The Yin emerges from the Yang and the Yang emerges from the Yin.

The symbol representing Yang is a horizontal bar (—), like a 1 turned on its side, and the Yin symbol is also a horizontal bar but broken (– –) in the middle. The Chinese method of vertical writing from top to bottom may have influenced this horizontal representation. Notice the similarity of this to the 1 and the 0. The Yang (—), like the 1, is surrounded by nothing to give it identity, and the Yin

(– –) is broken and shows an organization of the open (0) between the broken (– –) bar on either side. This parallels my perception of opposites. Eastern thought, moreover, specifically identifies the idea that objects are built to form, shape and organize *emptiness* and *void*. If eastern philosophers have already discovered this, then why say more about it?

I am not aware of Eastern intellectuals having integrated Yin and Yang philosophy with the 1 and 0 by showing this duality (1 and 0) as being the sole source of all opposites and the foundation of natural phenomena. These ancient concepts are, however, a support for the rightness of this binary approach to approximating reality.

Combining Yin and Yang symbols by grouping them on top of each other, the Yin and Yang philosophy has associated the developing patterns involved with nature and human beings. For example, to show seasonal changes the Yin and Yang philosophers produced a circular group of eight trigrams. A trigram is a group of three combinations of the Yin of broken lines and the Yang of unbroken lines. The extreme of seasonal change is between summer and winter. Winter is depicted by a trigram grouping of three all broken lines (☷) of Yin and summer by another trigram of three unbroken lines (☰) of Yang. Then the remaining six trigrams use other combinations to show the cycles between summer and winter. The balance and symmetry are highly developed. All the trigrams within this circular pattern have opposite trigrams showing the opposite seasons.

Seasonal changes show the relationship between the 0 and 1. The Yin of winter with its three broken trigrams (☷) shows the open (0) with its empty condition, while the Yang of summer with its three unbroken lines (☰) shows the closed (1) with its filled condition. A cyclical pattern is revealed. The earth's biological viability depends upon the going-away process of winter emission to return once more to the togetherness of growth and renewal through summer absorption. This corresponds to and is the empty and fill cycle of the 0 and 1. The empty (0) of winter is dependent

upon the summer fill (1) and the fill is dependent upon the empty.

This cycle is the earth's negative (0) and positive (1) fluctuation which influences us and is part of our makeup. The human body also goes through winter and summer fluctuations between empty and fill. Nature's "goal" is always to fill, but this must be preceded by the empty. Similarly, the winter (0) of the problem is needed to reach the summer (1) of the solution and the winter of ignorance (0) to reach the summer of knowledge (1).

The purpose of Chinese medicine is to maintain the flow of life which is called *ch'i*. The parts of the human body are represented by Yin and Yang. The Chinese physician aims to keep a balance between Yin and Yang which keeps the ch'i of life flowing. My interpretation of what ch'i represents is a flow between the emptied Yin and the filled Yang which maintains a balance between emission (empty) and absorption (fill). The *ch'i* of the flow of life is a balanced flow of a 1 to a 0 and a 0 to a 1. The flow of the human body is a flow between the Yang of life (1) and the Yin of death (0). Ch'i is this necessary oscillation between the 0 of death and the 1 of life.

Hunger and starvation increase the Yin over the Yang and old age is an imbalance in the reverse direction. In old age, the holes (Yin) within us are lost to the debris of unwanted Yangs. If the Yin of the empty is unavailable, we cannot reach the nourishment of the Yang and the filling process. Starvation and the inability to find the Yang (1) of food is a Yin-on-Yin (0-on-0) repulsion. Then the 0s of the human body are only met by the 0s of no food, until in later stages (old age) of our lives the Yang (1) of food loses the availability of the 0s within our bodies. This is another repulsion of Yang-on-Yang (1-on-1). Both types 0-on-0 and 1-on-1 arrive at the same result with the loss of life and the oscillating Yin (0) and Yang (1) of *ch'i*. There must be this cyclical pattern of balance between the Yin (female) through emission (excretion) and the Yang (male) through absorption (ingestion).

Corollary #4 is important to each of us because to understand the significance of the Yin (0) will give us direction toward

increasing our longevity. If we could create a perfect empty (0) with respect to our system's emission (elimination) process and also keep the availability of the fill of absorption — food, air, water — there is no reason why we could not live indefinitely. The ch'i would continue and life would flow on and on.

I am suggesting that the secret of life is to continue providing 1s for 0s that have continuing availability. The billions of people on earth show that we have solved many of the problems of producing the 1s for food. The problem of inadequate food production has been solved by industrial nations, but this has led to a new problem. After some 75 years, or earlier, humans are losing or have lost the availability of their 0s. They have the 1, but there is no place to put it. The food (1) for absorption remains available but they have lost the absorber (0). Their oscillations cannot continue. The 1-to-0 and 0-to-1 of the possible is not available.

What has happened? Our organs of elimination — kidney, liver, lungs, large intestine and veins — although magnificent emptying structures, reach the point where they cannot continue the proper emission necessary for continued absorption. Consider this. If the principle of emission (0) and absorption (1) is the basis of life's continuation, then we need to also focus on improving our ability to emit (empty). Of course, if we gained more efficient absorption, we would not have as much to emit. Or, if we could absorb less, this would necessitate less emission. But however efficient the input, our organs of elimination, in time, fail to output efficiently. An efficient output returns us to the 0 for the 1 to input again.

As an example of a solution, if we concentrate our knowledge and energy on developing an artificial kidney that is far superior to our own, then it can be used to maintain our spaces and to avoid their loss. At the end of the twentieth century, artificial kidney technology is in a stage of relative infancy. To advance this technology is to create better filters to remove the unwanted by-products of ingestion (absorption). If we can produce filters that will add 50 years to our lives, then we have even more time to make more improvements. This is an example of how we con-

tinue solving problems through the development and maintenance of holes to reach the fill. This is done on a limited basis today, but gaining this understanding of the 0 allows us to see the full implications of what is necessary for the extension of human life.

We clean house for the same reason the body cleans its house. To clean house is to reclaim the spaces to be used again for absorption. The analogy with the human body is that if we allow spaces in our house to become cluttered it becomes unusable. We either remove the clutter and reclaim the space in our house or we lose the house to clutter. The same is true for the body of our human house. Remove the clutter or lose it.

It is within our grasp to make great progress in this direction once this principle that gives us life can be clearly understood. We come back to this temporary death of the Yin (0) in order to renew ourselves with the life of the Yang (1). We put away the old to come to the new.

To me, the goal is clear: through effective maintenance of human 0s there is no reason individuals cannot live for many centuries. There are always solutions (1) to problems (0) and this is simply one more difficult problem to solve. It becomes possible when humans advance their efficiency and effectiveness to create and maintain 0s and then fill them. Perpetual life can be found in always returning to another empty to reach another fill. The impossible of a 1-on-1 and 0-on-0 can always be changed to the possible of the 1-to-0 and 0-to-1. It will not be easy, but with a clearly defined goal a long-term solution is not beyond reach.

MALE (1) AND FEMALE (0)

In the Hindu religion the god Shiva is represented as half female (yin) and half male (yang). In a larger sense all the constructions in nature are part of yin and yang. All containers are created to build the yin (0) so it can reach the yang (1). We differentiate the male and female of our species primarily by how nature built us for procreation. It takes little imagination to envi-

sion why the female represents the 0 and the male represents the 1 in the act of fertilization that brings new life.

The female is only empty prior to the fill. With the growth of new life she is in a positive (1) male condition. Human reproduction has created the primary differences between males and females. All other fluctuations we engage in are the same. Both sexes fill (male) and empty (female) with the same type organs and tissues and both sexes fill and empty the pathways and containers of civilization. The rules of emission and absorption are carried out and applied in the same way by both sexes except for procreation. The female has this added ability of oscillation (procreation) that males do not.

The sexual act is a dramatic example of an oscillation that demonstrates the fundamental base for all other oscillations. The purpose of what we do is to reach the fill of absorption. The question arises, if the fill is the purpose of the sexual act, then why don't we just fill and remain in the filled position? The pleasure is in the fill and in order to experience it again and again, we come to the empty again and again. This is an elegant expression of principle and the reason for universal action.

All structures are designed for the construction of an empty to reach the fill. A female construction is designed to be filled by the male. Some females are only designed to be filled once, but the most successful females continue to empty so they can return to the fill. To reach a fill for ourselves is what we enjoy in life. The *empty* is what we dislike, but is necessary to return to the *fill* that we like.

To seek alternative positions during sexual intercourse is to search for a better fill for each. The attempt is to absorb better by being absorbed. The better I fill my spaces the better you fill yours. The same driving force is behind our actions outside of sexual encounters. Our life is devoted to building better females (holes) with better emptying processes so we can return to the male (fill) in a more rapid and complete way. Nature continually confronts us with new problems that require us to build new solu-

tions. Our continued existence demands this male and female improvement and is the reason why we evolve.

We have named many kinds of receptacles female. This is because their empty (Yin) provides space for the fill (Yang). Whatever is put into, plugged into and screwed into — such as a screw turning inside a nut — the filling of the holes changes the female into a male and a negative becomes a positive. With this new perspective of change we can become more versatile in our use of opposites. We can apply them to many areas of human interest. All the nonphysical identified by the physical is female and all the physical identified by the nonphysical is male. We find one by using the other. To say that an object is *female* refers to the object's space development through a corresponding male. And to refer to an object as *male* indicates the object's physical development through a corresponding female. The male is the physical designed for entering the nonphysical female.

MORAL (1) AND NONMORAL (0)

Corollary #8

The foundation and source of all opposites is the physical (1) and nonphysical (0) with the resulting forces of attraction (0-to-1 and 1-to-0) and repulsion (0-on-0 and 1-on-1).

Corollary #8 was derived from analyzing a multiple of opposites in nature. This was followed by examining the antonymic nature of morality and immorality. It has led to the development of a new approach to morality that when practiced can prevent much of the destruction caused by the practice of traditional concepts of morality.

It has been taught that to practice morality is a lofty form of human conduct. The human ideal of moral behavior has included those standards which are said to be ethical, right, proper, virtuous, honorable, noble, honest and high-minded. Moral action has long been associated with saintly behavior. When an idea, philosophy, opinion or concept is said to be moral, it conveys the image that these are superlative doctrines beyond reproach. If people

are convinced a doctrine is moral and represents the highest degree of rightness, many will believe it should be the most sought-after goal of human action. It is said that this doctrine of moral action should encompass the actions of not just a few individuals, but all individuals. Moral attainment has been given such a high priority by some moralists that any action is justified in establishing the moral condition for all humanity. Throughout most of history, the attempt to force the "moral ideal" on the rest of humanity has led to great destruction and bloodshed. Faith and belief in the rightness of the moral ideal has led to the justification of organized terror to impose that ideal. Why has the implementation of the "highest" and "noblest" codes of morality led to terror and devastation?

In discussing moral with its opposite, I will contrast *morality* with *nonmorality*. A precise definition of *nonmorality* is key to arriving at a rational concept of morality. In defining moral and nonmoral it is important to attain consistency without demanding that one person's morality be the same for all others. When any "morality" is forced upon an individual, the force creates coercion and a slave condition for that individual. Whenever force is used to establish "morality," it imposes upon society what others have decided is moral. When morality is forced upon an individual, he does not have a moral condition of his own choosing.

The definitions of moral and nonmoral are synonymous with the definitions of *freedom* and *nonfreedom* (slavery). Human freedom is the success of reaching human absorption which is the ability to fill human spaces. Nonfreedom (slavery) is the failure to reach absorption and the filling of human spaces. The opposites freedom and nonfreedom are interchangeable with the opposites of moral and nonmoral. This interchangeability between antonyms is a derivative of the binary (0-and-1) foundation of nature. The definitions of *moral* and *nonmoral* are designed to replace traditional concepts of morality and nonmorality. To remove the devastating consequences of traditional morality will require a fundamental change in thinking.

This application of the 1 to *moral* and the 0 to *nonmoral* has produced surprising results. An unexpected conclusion has emerged while revealing some of the causes that have precipitated such terrible results from traditional morality. This is another example of what can emerge by showing the binary nature of all antonyms. The definitions of moral and nonmoral have been derived from the human motion (emission) that is used to fill (absorption) human spaces.

Moral (1) is the human action of filling human space (0) with the physical (1) of choice.

Nonmoral (0) is the human inaction of not filling human space (0) with the physical (1) of choice.

The 1 that is attached to moral represents a displacement of human spaces (0) by the physical (1) of choice. The 1 of the *moral condition* emerges from the success of filling the 0. The 0 is attached to the *nonmoral condition* because it represents the empty human space (0) without the physical of choice. The moral condition is the filled positive state derived from an addition process. The nonmoral condition is the empty negative state derived from a subtraction process. Nonmoral is the empty condition necessary to reach the moral condition of the fill. The viability of the binary human structure depends upon oscillations between moral and nonmoral conditions. Through the availability of the nonmoral condition, humans act to reach the moral condition. The 0 of the nonmoral state is used to reach the 1 of the moral state. This is a part of the cyclic repetition of freedom and slavery, life and death, solutions and problems and all antonyms. Nonmoral — in contrast to common concepts of immorality — represents the empty 0 condition with the possibility of filling it with the moral condition. The definitions of nonmoral (0) and moral (1) relate to humans in the same way that problems (0) and solutions (1), death (0) and life (1), slavery (0) and freedom (1), relate to humans.

Human success is the condition where the nonmoral (0) is displaced by the moral (1). And human failure is the condition where the nonmoral (0) is not displaced by the moral (1). Without

the existence of one opposite, there cannot be an arrival to the other opposite; therefore, both nonmoral and moral concepts are natural parts of the human condition.

All opposites are related through their common foundation of the binary 0 and 1. A *problem* is the 0 of the nonmoral condition and the *solution* is the 1 of the moral condition. The problem represents human *inaction* or human failures in reaching absorption (moral position of the fill). The solution represents human *action* or human successes in reaching absorption and the moral condition. Without the nonmoral condition of the problem (0) there is no possibility of reaching the moral condition of the solution (1). There must always be the availability of the empty 0 prior to the fill of the 1. A problem (0) is a losing posture for humans and is required to reach the solution (1) of the winning posture. A loss results in the nonmoral condition of a problem necessary for reaching the gain of the moral condition of a solution. The loss by departure is necessary for the gain by arrival.

The above conclusions are derived from the principle that 0 and 1 applications are a part of all opposites. This places very different definitions on the concepts of *moral* and *nonmoral* that depart from traditional views. This new view redefines the concepts of moral and nonmoral (immoral) with the aim of limiting the destructive actions taken by humans in the name of morality. An important step in this direction will come with the understanding that each individual oscillates between his own moral and nonmoral states for his own survival. To label one person as predominately "moral" and another as predominately "nonmoral" is incorrect. Every individual has his own balance between moral and nonmoral states. The moral and nonmoral definitions are precise: all individuals oscillate between both moral and nonmoral states for survival. Everyone uses inaction (nonmoral) to arrive at action (moral).

These definitions of *moral* and *nonmoral* identify the oscillations necessary for life. In contrast, the traditional concepts of morality are directed toward creating a world where only moral conditions prevail. It has been commonly held that the goal of life

is to reach only a state of morality. The idea of restricting our lives to only the moral ideal has led to fanatical attempts to force that morality upon others. Many have claimed that if they cannot convince you of the "correctness" of their morality in this life, then they must impose that morality upon you or you will suffer the consequences in the next life. The most destructive prejudices have been held by those who are convinced that the way they fill their spaces is the way everyone else should fill them.

Those who invade the property and person of others are traditionally considered to be nonmoral (immoral) and responsible for imposing a loss upon others. However, by declaring that the actions of the invaders of property are nonmoral, this may eliminate the individual's feelings of responsibility for protecting his property. He may conclude it was entirely the invader's fault that his property was stolen or destroyed. Where it is believed that the problem is entirely caused by the nonmoral actions of the invader, then it may also be believed that the solution is to use physical force against the invader. The solution to the problem, it is said, is to deal with the one "responsible" for the attack upon property. However, apprehending, convicting and jailing the culprit is not the solution. The responsibility of the owner must not be overlooked. The owner must bear the responsibility for his loss because he placed his property in a position that allowed its seizure. If we perceive the prime problem of insecurity to be pervasive theft, then the only solution may appear to be the elimination of the thief. But this approach overlooks the owner who provided the possibility of a successful attack upon his property in the first place. The owner allowed the problem and, therefore, the solution lies in the hands of the owner. By placing the sole or prime responsibility upon the thief, the solution to the problem appears to occur when the thief is put away or decides to end his thieving ways. However, stopping one thief by force will not stop other thieves if the property remains unprotected. It is difficult to convince thieves to end their thieving when all they see is unprotected property for the taking. In reality, the more efficient solution is for the owner to place his property and person in a

place unexposed to attack. Through greater security, this minimizes or eliminates the cause of the problem by not allowing it to happen.

It is important to realize that property protection is never complete or perfect. The means to protecting life and property is learned and understood through our failure to protect it. Incompetence and inefficiency is always a necessary condition to reach higher levels of competency and efficiency. Noncontrol of property is a natural condition at someplace and sometime. No one possesses perfect knowledge of how to protect himself and his property. Through natural assaults (fire and flood) and human assaults upon property, we learn how to develop better solutions for property protection. We learn of our ignorance of the ineffectiveness of our security through aggression against our property. Once our ignorance is recognized, we can then replace it with the essential knowledge of successful protection. Ignorance is the necessary nonmoral condition that allows the successful attainment of the moral condition through greater knowledge. The reach for improved moral conditions is spurred by nonmoral conditions which are the ongoing oscillations of human survival.

Within the parameters of these new definitions, let us reexamine the traditional concepts of morality. To call someone "immoral" is often an individual's attempt to place the cause of his personal problems on someone else. Present concepts of immorality (nonmorality) often shelter the individual from being accountable for his own security. The assertion that others are nonmoral tends to absolve the individual of the necessity of considering his own nonmorality. When others are thought to be the source of the problem, the individual can now negate the fact that *they* are the source of the problem. The focus is only on what is considered to be the nonmorality of others. By attacking others regarded as nonmoral (immoral), individuals believe they can arrive at a moral state for themselves. This often becomes a justification for wars and destruction. In pursuing the destruction of what is considered to be immoral (nonmoral), everything else may be destroyed in the process. In contrast, let us consider the

idea that *moral* and *nonmoral* are self-created through the *action* and *inaction* of each individual. A loss is the nonmoral inaction of being unable to fill our spaces. A gain is the moral action of being able to fill our spaces. The actions of others may place us in a nonmoral condition, but we made the condition possible. The elimination of the nonmoral condition is the prime responsibility of the one whose property has been compromised. To destroy the invaders and attackers of property is not a workable solution. The solution lies in the prevention of loss through attacks upon persons and property. If we merely remove or eliminate those who attack and steal, in time, they will be replaced by others who attack and steal. The incarceration of criminals is never a long-term solution and rarely a short-term solution. The efficient and moral solution is to place property and persons where they cannot be harmed. The one who destroys is not the problem, but the one who allowed it. Only when problems become our *own* problems can we began creating our *own* solutions.

What happens when a thief steals something? The definitions of moral and nonmoral indicate that the successful thief has reached a *moral* state for himself while the victim who has lost his property has reached a nonmoral state. For the victim, the loss of his property creates the void of a nonmoral 0 of his empty space instead of the moral 1 of his space filled with property. Due to his loss, the victim is now in a nonmoral condition. He can then return to a moral condition by replacing the loss. It is the owner's space that is filled when the loss is replaced. When individuals acquire property, it is in their interest to acquire the responsibility to maintain, protect and retain their property. Property destruction and loss can occur for many reasons other than human action. When floods and fires destroy property, we do not label the water and fire as being nonmoral. When the owner's property is damaged by either acts of nature or acts of man, it is the owner who did not take effective precautions for the protection of his property. There are solutions for the prevention of loss and it is the owner's responsibility to provide them. I am suggesting that the nonmoral label be placed upon the one who sustained the prob-

lem of loss by allowing the problem in the first place. The value of a problem is to provoke a solution. We will fail to create solutions to our problems if we persist in believing that someone else has the problem and is the cause of the problem when it is our problem.

It may seem preposterous to place the victim who has been attacked into a nonmoral condition and the successful thief into a moral condition. However, it cannot be denied that the thief was successful in filling his spaces with the victim's property while the victim was unsuccessful in filling his spaces because his property was stolen. It is useful for the victim to accept the nonmoral role if he can understand that he made the problem possible.

It is important to realize that the moral condition of the successful thief is a necessary challenge for the continuing evolutionary advancement of humans. For our intellectual growth to continue, nature must continue to challenge by exposing our weaknesses and vulnerabilities. Without the successful attack on property, we will not be motivated to devise better methods of protection. Knowledge of our vulnerability comes after our defenses are breached. If we ever solve the problems of human aggression, there will always be the problems of losses caused by natural events such as earthquakes, hurricanes, tornadoes and much more. It is only through our incompetence, losses and failures that we are challenged to reach competence, gains and successes. Learning and progress depend upon the existence of new nonmoral states for acquiring new moral states.

Security consultants are often hired by companies to expose their unguarded and unprotected areas. The aim is to enhance security and prevent harmful acts of nature or of man. Security companies may even hire former thieves to use their expertise to discover defensive weaknesses in advance of a problem. In this case, a former thief can provide value from his past moral conditions (success at filling his spaces). He now provides solutions for others instead of problems.

The question arises, should a human goal be to reach an ultimate moral condition where all people are in control of one hun-

dred percent of their property? Man's evolutionary progress has been dependent upon his not having been given control of his property by nature. For this progress to continue, it is essential that man be continually confronted with the possibilities for a lack of control and loss of control. Understanding what we cannot control creates the possibility of providing better controls and protection for persons and their property. The problems of the nonmoral condition present the challenges of life necessary to reach moral conditions and solutions. Problem solving is the basis for our continuing evolutionary progress. This is the essence of Darwinian evolution. The everpresence of problems and our ability to solve them have enabled us to evolve to our present structural status. Our species has developed its characteristics by responding to continuing problems with continuing solutions. And the continuing assault upon human property by both humans and nature is necessary for human growth and development. Continued human growth follows continued aggression against us that brings new forms of aggression with new challenges. The fact that we are confronted with primarily new problems indicates that we have put away old problems. Solutions eliminate old problems while providing the necessary knowledge to solve new problems.

For humans Darwinian evolution is the survival of those who successfully compete for filling their spaces with the physical of choice. The cyclic oscillations of the filled moral condition and the empty nonmoral condition following each other represent the frequencies necessary for all life to continue. Emission is used to reach absorption of the filled (1) moral condition and emission is used to reach the empty (0) of the nonmoral condition. Biological competition is the competing process for the 0 of absorption. Evolution becomes more comprehensible by introducing the oscillating 0s and 1s involved in our binary universe. A moral imperative exists for the survival of all objects. An object's response to changing moral and nonmoral conditions is adaptation and necessitates evolutionary structural changes.

The solutions to problems caused by humans represent only a small part of the solutions we must reach for survival. Since the

iron age, tool makers have known that rust can attack their iron tools. Oxygen successfully fills its spaces with iron, creating the iron oxide known as rust. When unchecked, rust eventually destroys all human tools made of iron. This places us in a nonmoral empty condition preventing us from filling our space with a valuable tool. The problem created by nature's attack upon iron tools has been partially solved through the development of protective coatings to prevent the successful absorption of oxygen. Oxygen's absorption of iron — like a thief's absorption of property — renders the iron unavailable to its owners. This example demonstrates a weakness and a loss for humans, leading to strength and a gain for humans. Labeling oxygen as "nonmoral" and waiting for its "morality" is not a solution. There was no attempt to destroy oxygen as a solution to rust, and naming oxygen as a "thief," though true, is unproductive. We realize that nonexposure is security for iron and is the effective solution. The problem was solved by making iron unavailable to an assault by oxygen. This same strategy offers a solution to the problem of human invaders and thieves who attempt to absorb our property. The solution is to make the property unavailable to thieves and invaders. Successful methods for approaching problems brought about by nature are similar to those brought about by humans. Whether humans or nature unveil our weaknesses by destroying our property, such invasions will continue to occur, spurring us in new directions toward new progress.

Successful stealing is a moral condition for the thief and a nonmoral condition for the victim of theft. But why place the label of nonmoral on the one who allowed the theft? Because nonmoral is a concept of human failure.[1] Therefore, why should the concept of nonmoral failure be placed upon the one who was successful: the thief? The thief has provided an indirect value for the one who lost his property. The loss creates a problem and a challenge nec-

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[1] NONMORAL – Nonmoral is the human inaction of not filling human space (0) with the physical (1) of choice.

essary for reaching a solution. The solution is how to successfully protect property from human theft. Instead of attacking the thief after the theft, the owner places his property in a position where it cannot be stolen. Theft is possible only where property is insecure. Through theft, the owner becomes aware of his property's vulnerability and he can now reach the solution: protection. The marketplace offers multiple solutions for property protection that would be unavailable without the original failure or inability to protect property. The efficient and effective solution for property protection is for the owner to provide its protection. This eliminates theft without eliminating the thief. Humans prefer doing those things that bring them success and the moral condition. If thieves are unable to steal — or if the cost of theft becomes too high — they will do something else. The solution to robbery is to provide an environment where robbers cannot succeed. It is important to realize that the protection of property and life is an ongoing problem. If we should ever solve the problem of man attacking his fellow man, then there must be continuing problems from other sources. Without the nonmoral condition, these challenges, solutions and progress will be lost. The nonmorality of the losing situation is necessary for the morality of the winning situation. Without individual losses from the failure (nonmoral) to fill spaces, there is no possibility of individual gains from the successful filling of spaces. To lose is a result of ignorance and to win is a result of knowledge. There is no survival without using ignorance to reach knowledge.

People point to the "immoral actions" of others as the cause of the world's problems. All of society's ills are believed by many to be derived from the immoral actions of their fellow human beings. However, the problems of humanity only become entrenched problems when those who really have the problems find no solutions because they believe it's not their problem. The nonmoral condition includes only those people who do not provide solutions to their own problems. If the solution is perceived to be found in waiting for others to stop their immoral actions, then there will be no solution. Those who wait for solutions are

nonmoral because their nonactions leave them in a nonmoral condition. When the thief has successfully filled his spaces with the owner's property, the thief has the solution and the owner has the problem. With this loss comes the opportunity to add to the success of civilization through better property protection. It is incumbent upon the one with the problem to find the solution.

A property solution (moral state) through security places the would-be invaders of property in a position where *they* have the problem (nonmoral state). Robbers and thieves can no longer reach a solution by filling their spaces with the property of others. The nonmoral condition is now on the would-be invaders. The thief is in the empty 0 state (nonmoral). His means of support and survival must be reached through another means other than theft. The owner's successful property protection limits the thief's options to productive solutions for his survival. The former thief's new direction may create protective solutions for sale in the marketplace. This is an example of how creating protective solutions for ourselves can lead to changing the moral direction of others. By solving a property problem, the owner directs the thief in the opposite direction toward a new moral condition. The former thief's new direction may create a new moral condition that may be purchased in the marketplace by the very owner who was originally victimized by the thief. The owner's solution to theft through protection and the former thief's solution to survival through production may both be sold in the marketplace for their benefit and the benefit of others.

The marketplace is a moral place because only moral conditions are traded. When nonmoral conditions are changed into moral conditions this produces solutions that can be sold. The marketplace is kept viable and changing by the continuing new nonmoral states (problems) leading to new moral states (solutions). Humans must continue to confront new losing processes in order to create new winning processes for sale in the market. The secret of durable success is to put away old losses to reach new losses for their conversion into new gains. The market represents inputs (1) of individual morality realized by replacing individual

outputs (0 of nonmorality). A free market is a moral imperative for human survival. The ability to reach and trade the moral condition, through the nonmoral condition, will propel us beyond the solar system.

When using these new definitions of morality, the statement that someone's actions are immoral (nonmoral) becomes an internal contradiction. The concept of action indicates the successful act of emission leading to absorption. Absorption through emission is action and represents arrival at the moral state. And the nonmoral state occurs when action reaching absorption does not occur. Nonmoral is the necessary inaction prior to the action (emission to absorption) necessary to reach the moral state. Nonmoral is the inaction of humans to fill (1) their spaces (0). To be nonmoral is to be in a state of inaction.

To force a moral condition on others is destructive in the long term because the enforcer determines an individual's action and not the individual. The enforcer's moral code is forced upon others. If enough people are forced into servitude through such enforcement, this drastically limits new moral conditions for the marketplace. A slave's failure to solve his problems limits the creation of new moral conditions in the marketplace. The slave master has unknowingly eliminated benefits for himself and others of purchasing new solutions from those he has enslaved. The slave master destroys this market for himself and everyone else. It becomes an unseen problem for everyone who cannot participate in the solutions of others. By allowing others to create their own solutions (moral conditions) we can profit by purchasing these solutions in the marketplace. By forcing a "moral" condition upon others, we lose the creative potential of their own independent moral states. Through slavery we miss the opportunity of becoming part of their moral condition. The marketplace creates the ability for individuals to trade value and learn from each other through trade. Without trade, most humans cannot continue to exist. Humans are dependent upon the market for survival. How can new knowledge be reached where people are forced to accept and use only old knowledge? There is no continuing mar-

ket without adding new knowledge to old knowledge. Humans need each other for the solutions (moral state) necessary for survival. Survival is a moral imperative. Continuing accessibility to new states of morality is mandatory for survival. The moral direction is a survival direction. Structures must improve or disappear. This is nature's strategy for ongoing evolution.

For human progress to continue, it must always move in a moral direction. The moral direction can only be seen through the nonmoral. This is another way of stating that the 1's direction can only be seen through the 0. The purpose of human life is to reach a moral condition of a fill for ourselves. This means we live in a world where challenges always exist and provide a reason for existence. This includes continually finding better approaches to morality.

This new identity for nonmoral and moral recognizes that we cannot always be right. Going in the "wrong" direction only means that we cannot always go in the "right" direction. To ignore, however, our nonmoral states will eventually destroy us. The wrong road is the nonmoral condition of nonarrival. But without the wrong road, it is impossible to find and reach the right road for arrival and survival. There are infinite possibilities for reaching the moral condition. If man does not survive, it will not be dictators, rulers, tyrants and oppressors who have caused his demise. Nature's "blame" will fall upon each individual who was unable to find or create the solution to his or her problem. It is incumbent upon every individual who has a problem to attempt its solution. One lone individual's solution can lead to the survival of millions and even the species. This has already been demonstrated in science and technology where a relatively few innovators have solved problems for themselves that led to the survival of hundreds of millions who would not have survived. We must never underestimate our possibilities for reaching new moral conditions.

There will never be a solution to provide permanent human survival. Survival always means the possibilities of nonsurvival.

The moral imperative is ongoing. New survival techniques will always yield new problems and the possibilities of nonsurvival.

The longer it takes to reach a solution to a problem the greater opportunity the problem has to grow in size. The rise of dictators and tyrants is only reached after long periods of unsolved problems involving the failure to protect property and persons from political attacks. Centuries of existing with nonmoral conditions give rise to enormous problems that result in pervasive destruction. The solution lies in focusing on individual responsibility for solving the individual's problems and not the invaders and oppressors who have taken "advantage" of individual weakness and the failure to protect themselves from invasion and oppression. It is impossible for every individual to solve all of his problems. This is why it is necessary to create a marketplace for the conversion of these impossibilities into possibilities. We provide value for the market through the moral conditions we can create which allow us to purchase the moral conditions created by others which we cannot create.

The nonmoral condition of problems must be ongoing for human survival. "Problems" are not the problem. The real problem is created by the failure to continue the oscillation from problems to solutions. Our continued existence shows that we have continued to oscillate between the negative of nonmorality and the positive of morality. But some problems have been around for so long without solutions that there is no problem/solution frequency. For human survival, there must be an ongoing frequency between these negative and positive conditions. An example is the balanced frequency for survival between the moral condition of food absorption and the nonmoral condition after waste emission. Without the appropriate time frame for the cycles between problems and solutions we face extinction. As more individuals become involved in reaching their own morality, the possibilities for species survival increase.

This theory covers a broad territory of knowledge that includes many areas of human action that are yet to be discussed. There is opportunity for others to broaden the integration of the 0.

It is time to publish, which is always an invitation to test and criticize that which is offered. Whatever the response, it has been a mental adventure in searching for the secrets that unlock the mysteries of the binary universe.

(0-to-1 + 1-to-0) + (0-on-0 + 1-on-1) → ①

Attraction plus Repulsion yields Purpose

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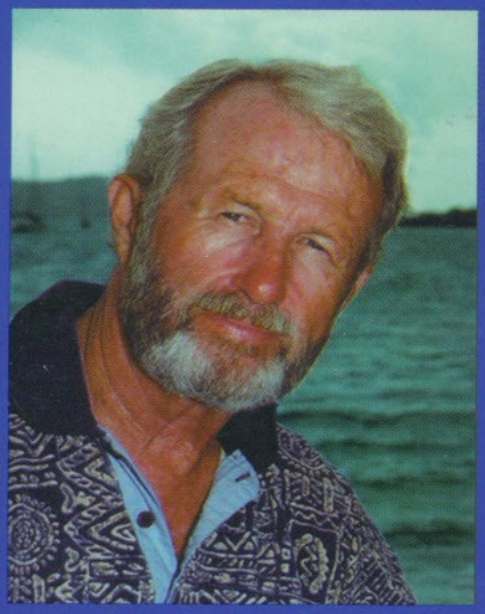

lyle d jacobson

Here is a philosophy which shows that the base and common ground for what we do is the same for all of nature.

The computer is thought to be unique in its binary (0 and 1) applications. However, this work demonstrates that the universe, as well as humans, operates from the same 0 and 1 binary foundation.

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Lyle D Jacobson's concepts are the results of spending a lifetime observing natural phenomena. At present he lives aboard his vessel "Contrast" in the Caribbean.

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